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SIXTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF OHIO,

FOR THE

YEAR ENDING OCTOBER 31, 1891.

COLUMBUS, O.:
THE WESTBOTE COMPANY, STATE PRINTERS.
1892.

Ohio State Board of Health,
Office of the Secretary,
Columbus, Ohio, *December* 18, 1891.

To His Excellency, James E. Campbell, *Governor of Ohio:*

Sir: In accordance with Section 8 of an "Act to create and establish a State Board of Health," the accompanying report is herewith submitted for the year ending October 31, 1891.

Respectfully,

C. O. Probst, M. D., *Secretary.*

MEMBERS OF THE BOARD.

	Term expires.
H. J. Sharp, M. D., London	December, 1892.
S. A. Conklin, M. D., Canton	December, 1893.
E. T. Nelson, M. A., Ph. D., Delaware	December, 1894.
*A. J. Scott, M. D., Loudonville	December, 1895.
S. P. Wise, M. D., Millersburg	December, 1896.
William T. Miller, M. D., Cleveland	December, 1897.
Thomas C. Hoover, M. D., Columbus	December, 1898.

* Subject to confirmation.

STANDING COMMITTEES.

Hygiene of Occupations and Railway Sanitation,
A. J. SCOTT, M. D.

Epidemic and Endemic Diseases and Quarantine,
S. P. WISE, M. D.

Topography, Meteorology and Hygiene of Public Institutions,
S. A. CONKLIN, M. D.

Water Sources, Drainage and Disposal of Substances Injurious to Health,
H. J. SHARP, M. D.

Especial Sources of Danger to Life and Health,
THOMAS C. HOOVER, M. D.

Adulteration of Food, Drinks and Drugs,
WILLIAM T. MILLER, M. D.

Heating, Ventilation, Lighting and Hygiene of Schools,
E. T. NELSON, M. A. Ph. D.

Vital Statistics, Registration and Nomenclature,
THE SECRETARY.

Finance and Executive,
E. T. NELSON, S. P. WISE, S. A. CONKLIN.

GENERAL REPORT.

The following report of the State Board of Health comprises work of the Board for the year ending October 31, 1891.

PERSONNEL OF THE BOARD.

Two changes in the membership of the Board have been made since its last report:

The term of office of Dr. D. H. Beckwith having expired, Dr. Wm. T. Miller, of Cleveland, was appointed to fill the vacancy so created. Dr. A. J. Scott, of Loudonville, was appointed to fill the unexpired term of Dr. Jos. L. Anderson, who tendered his resignation. This appointment is subject to confirmation by the Senate.

Dr. Thos. C. Hoover, of Columbus, was re-appointed for the term of seven years, ending December 13, 1898.

The names and addresses of the members of the Board are as follows:

H. J. SHARP, M. D., *President*..... London.
S. A. CONKLIN, M. D ..... Canton.
E. T. NELSON, M. A., Ph. D..... Delaware.
A. J. SCOTT, M. D..... Loudonville.
S. P. WISE, M. D..... Millersburg.
WILLIAM T. MILLER, M. D..... Cleveland.
THOMAS C. HOOVER, M. D..... Columbus.
D. K. WATSON, *Attorney-General, ex-officio.*

THE WORK OF THE BOARD.

The work of the Board has greatly increased during the past year. The correspondence of the office has never been so large in any previous year; questions of the greatest diversity relating to health matters are being received from every quarter of the State, and the Board has become closely in touch with the people. The Secretary, as executive officer of the Board, has been called to a large number of places where advice and assistance were needed.

The control of infectious diseases, the abatement of nuisances, the introduction of sewerage and water-works, and many other matters re-

lating to public sanitation, have required visitation from the Board. These demands have, in fact, become so frequent that it has often been impossible to comply with them. The Secretary, if every call were answered, would be required to be almost constantly from home. Where a personal visit is absolutely essential it is never refused; but assistance can very often be given by letters or telegrams, which method is adopted whenever possible.

One public institution was inspected during the year; this was the Central Insane Asylum. The inspection revealed some grave defects in the sanitary condition of the institution which should not be allowed to remain. The drinking water is obtained from driven wells at the east side of the grounds, but it has sometimes happened that the tank into which this supply is pumped is, for various reasons, filled from a tank immediately above it which contains water from the Scioto river. This water is unfit for domestic use, and is probably at times even dangerous. The plumbing of the building is very old and exceedingly faulty in construction. The inmates are at all times more or less exposed to all the dangers of sewer gas. Other conditions were found detrimental to health, which are fully set forth, with the recommendations of the Board for correcting them, on a subsequent page of this report. A copy of the report of the Board's findings, with its recommendations, was transmitted to the Trustees of the institution.

INVESTIGATION OF THE POLLUTION OF THE OHIO RIVER.

The Board, acting under the directions of the last General Assembly, has undertaken an investigation of the pollution of the Ohio river. It was deemed necessary in commencing the work, to limit the investigation to determining, as nearly as possible, the character and extent of the pollution of the public water supplies of the Ohio river towns in Ohio. Dr. H. J. Sharp and the Secretary were appointed a committee to make this preliminary investigation.

Commencing above and going down the river, we find the following cities in Ohio, in the order named, that are taking public water supplies directly from the Ohio river:

East Liverpool, Wellsville, Toronto, Steubenville, Martin's Ferry, Bridgeport, Bellaire, Portsmouth, Ironton and Cincinnati. Wells have been practically abandoned in all of these cities except Toronto and Bridgeport, so that by far the major part of the inhabitants depend upon the Ohio river for water for all purposes. Toronto and Bridgeport have just completed water-works, and consequently still depend largely upon wells for drinking and culinary purposes. A personal inspection was made of the water-works

of each of these cities and their surroundings, with special reference to sources of pollution. Arrangements were made with the health authorities of each city to furnish samples of water weekly for chemical and biological examination. Except for Cincinnati, the chemical examinations are being made by Prof. C. C. Howard, of the Starling Medical College, and the biological examinations by Dr. A. M. Bleile, of the Ohio State University. The samples collected at Cincinnati are being examined by Dr. W. Dickore and Dr. J. C. Oliver, the former doing the chemical work and the latter the biological.

Owing to unavoidable delays this work was not commenced until the latter part of September. Samples were examined weekly for eight successive weeks, when it was deemed advisable to continue the examinations monthly for the winter.

An important feature of this work, as projected by the committee having the matter in charge, is to determine the character of Ohio river water actually in use by any city as compared with water taken from an available point which would seem to offer hope of affording such city a purer water supply.

This has only been done for Cincinnati. The examinations at Cincinnati represent water as it is pumped from the river to the reservoir, and water from the river opposite Coney Island, at about the location of the Newport water-works.

We will thus be able, when these examinations have been carried on a sufficient length of time, to determine, as far as may be by chemical and biological examination, the advantages, as to purity of supply, that would be obtained by moving the pumping station of Cincinnati's water-works above the sources of her own pollution, and of that contributed by the Little Miami river.

Three questions, if possible, should be answered by this investigation: 1st. Does the Ohio river along any part of its course bordering on Ohio afford a reasonably safe supply of water for domestic purposes? 2d. Are the Ohio cities which obtain water from this source getting the purest supply available? And 3d. What measures could be adopted either to prevent pollution of the Ohio river, or to purify and make safe public supplies obtained therefrom? Leaving the first and last questions unanswered for the present, let us see whether our Ohio river cities are obtaining the best supplies available. The water supplies of some of these cities are unavoidably, perhaps, exposed to pollution from sources over which they have little or no control. This is notably the case at Bellaire, which has located its pumping station about four miles below the city of Wheeling, W. Va., a city of 50,000 inhabitants, which discharges its sewage into the river. Wellsville is also unfortunately

located in this respect, for the sewage of East Liverpool, a growing city of 12,000 inhabitants, is discharged into the Ohio river not more than four miles from the pumping station of Wellsville. Both of these cities, however, are responsible to some extent for the pollution of their own water supplies. Bellaire is discharging its sewage into a run which enters the Ohio river immediately above their pumping station; and in spite of the fact that the attention of the city authorities was officially called to the danger of this practice, it is proposed to empty the sewage of a new sewer district into this same run. Other sources of pollution exist above the water-works within the corporation of Bellaire. With but few exceptions, the water supplies of all the cities named are exposed to local sources of contamination which, by changing the location of their pumping stations, by extending their supply pipe to another part of the river, or by controlling the disposal of factory wastes and other filth immediately above them, could be avoided. Cincinnati, Portsmouth and Steubenville are examples of cities which have *grown above* their water-works; and a considerable amount of filth not carried by sewers must unavoidably, during storms, be washed into the river above their pumping stations. To move these above the sources of their own pollution would entail considerable expense, and it is not greatly surprising that this has not hitherto been done. But what can be said in support of building new pumping stations on the site of the old ones, when by going a short distance above, a much purer supply could have been obtained! Portsmouth is now doing this, a new pumping station with new pumps having just been built immediately below the old one. Nearly half the population of Portsmouth is above the pumping station. This city is underlaid with a bed of loose sand and gravel, and the Board of Health *requires* all privy vaults to be dug to this layer. These vaults are uncemented and, as a rule, never require cleaning, as their contents drain freely away. Numerous springs break out along the river bank, both above and below the pumping station, and it is extremely probable that they are largely supplied from privy vaults.

The city of Wheeling, W. Va., affords another example of what a water-works board, unguided by scientific knowledge, may be expected to do in selecting a water supply. Their present pumping station is located a short distance below a large hospital that discharges its sewage, which must necessarily in this instance be exceedingly foul and dangerous, into the river. In addition, the sewage of a large portion of the city is discharged into the river *above* their pumping station. The works have become inadequate, and additional supplies of water are demanded for fire protection. The present water-works board propose to build a new pumping station with new machinery, and *locate it on the site of the old*

one. Toronto, Ohio, has just completed water-works, and has also made the fatal mistake of obtaining its water supply from the Ohio river at about the center of the city. Several small but growing villages, which will likely belong to Toronto some time, are immediately above, swelling the number of persons who will contribute to the pollution of the water supply.

An immense amount of filth finds its way into the Ohio river along the five or six miles of shore line just above the pumping station of Cincinnati. While it is the intention, by means of an intercepting sewer, to deliver all of the city's sewage from above the water-works to a point just below, it is nevertheless true that drainage from numerous privy vaults gets into the river *above* the pumping station; and there is no attempt made to prevent the emptying of house slops, filthy street washings, etc., into the river above. The conditions described must necessarily grow worse with time; and with such examples of bad judgment, or worse, before us, affecting as they do the health of thousands of people, we may well ask whether the full control of matte of such vital interest should be placed in the hands of municipal authorities, or left with private corporations, which are even more liable to furnish an objectionable water supply. These cities exercise the right to close a private well if it is liable to be polluted; in fact, in nearly all of the cities obtaining public supplies from the Ohio river, the use of wells is prohibited.

Should not these cities in turn be prohibited from furnishing in stead, any but the purest water that can be obtained?

We do not mean to advocate that cities should be required to make unreasonable expenditures for this purpose; but the selection of a suitable source for a public water supply requires a scientific knowledge that the average member of council or board of water-works, who usually control this matter, does not possess; and we respectfully suggest that all public water supplies, prior to the construction of water-works, should receive the approval of the State Board of Health. With such experts as it could call to its aid, the question of the purest available water supply could be fully determined. The decision reached in this manner would be wholly uninfluenced by questionable motives which may possibly sometimes determine the location of water-works under present methods. The expense connected with the selection of a water supply by the State Board of Health should justly be borne by the city or corporation furnishing the water.

HEALTH OF THE STATE.

It is not possible to make a satisfactory report upon the health of the State during the past year. To be able to accurately show what diseases

had increased or decreased as compared with former years, and the relation of such increase or decrease to the age, sex, condition, occupation, etc., or to the location of those affected, would require fairly accurate and complete returns of the deaths which occurred during the year. Until there is a satisfactory collection of the vital statistics of the State there can be no scientific study made of the conditions affecting the public health.

The returns made to the Secretary of State for the year ending March 31, 1891, give 40,942 deaths for the total for the State. With a population of 3,672,316, according to the United States Census report for 1890, this would equal an annual death rate of 11.12 per 1,000 living inhabitants; this would be lessened by the increase of population between the time of taking the census and the end of the fiscal year—March 31, 1891.

We nave no reason to hope that the death rate in our State is but 11.12 per thousand inhabitants. Massachusetts, where comparatively accurate returns are made, had a death rate for 1889 of 19.21 per thousand inhabitants. The death rate in Connecticut for the year 1888 was 17.8, and Rhode Island for the same year, 20.4 per thousand living inhabitants. It is not probable that the annual death rate in Ohio ever falls below 17 per thousand living inhabitants, and it doubtless is often higher.

The mortality reports received from local boards of health during the year represent an average population of 1,244,809, equal to about one-third of the total population of the State. The total number of deaths reported in this population was 20,958, equal to an annual death rate of 16.48 per thousand. During the preceding year there were 21,648 deaths reported in an average population of 1,212,727, equal to a death rate of 17.85 per thousand. Assuming the errors to have been equal each year, this means that one person less in each thousand of the population represented died last year (twelve months ending October 31, 1891) than during the preceding year. If this ratio would hold good for the entire State it would mean the saving of 3,672 lives as compared with the previous year.

It is a satisfaction to note that this decreased death rate was due to a diminution of the deaths from the zymotic diseases—the so-called preventable diseases, and especially to the lessened number of deaths from diphtheria and typhoid fever. There were 490 less deaths reported from croup and diphtheria during the past year than were reported during the preceding year, and 57 less deaths from typhoid fever. As the population represented exceeded that of the preceding year by 32,082, the reduction was in reality considerably more than this, the death rate from croup and diphtheria having been .98 per thousand inhabitants as compared with 1.41 during the preceding year.

There was also a material reduction in the number of deaths from

measles, scarlet fever and whooping-cough, there having been 352 cases of these three diseases reported as compared with 569 cases the previous year. The deaths from cholera infantum and diarrhœa also show a diminution as compared with the preceding year.

There was but a slight reduction of the deaths reported from local diseases. The deaths from bronchitis and pneumonia, which during the previous year were so greatly increased by the epidemic of influenza, were nearly as many during the year just past—probably from the same cause. Deaths from other causes remained materially the same as during the preceding year.

While it would be unfair to claim that this reduction in the zymotic death rate has been entirely due to the work of the health service of the State, it is reasonable to suppose that our boards of health, by having infectious diseases promptly notified, by quarantine restrictions, and by the enforcement of disinfection and private burials, have been largely instrumental in this result.

SMALL-POX IN OHIO.

Six cases of small-pox were reported during the year, none of the patients dying. Five of these cases were in a house located on the grounds of the Urbana Camp-meeting Association, about two miles from Urbana. The first patient came home with the disease, which he contracted near New Orleans, and went to his father's house upon the grounds of the Camp-meeting Association. The father, mother, and two other persons living in the house, subsequently contracted the disease. Quarantine was established, and the house happily being situated in the woods away from all other families, the disease did not spread beyond this family. The State Board of Health was called upon to advise as to the proper disinfection of the building, when the patients were ready to be discharged. This building was an old frame structure containing six or eight rooms, loosely partitioned off, part of the outer walls being of lattice work. During camp-meeting it was occupied by several families, and part of their household goods were still there, none of great value, however. It was manifestly impossible to disinfect this building by fumigation; and as several thousand persons visit the camp-ground each year, it was deemed advisable to order the destruction of the building and part of its contents by fire. The order was most thoroughly carried out by the Trustees of the Association, the entire building, out-buildings and surrounding board walks being completely burned. An inspection of the camp-grounds was subsequently made by the Board, and these were found in an excellent sanitary condition. A certificate to that effect and of the complete freedom of the grounds from all danger of

small-pox, was given to the Association, enabling them to remove all fears of persons contemplating attending the meetings which were held there a few months later.

One other case of small-pox occurred at Cleveland—a man stealing a ride from Chicago was found, on his arrival at Cleveland, to be in the initial stage of small-pox. Fortunately no one was exposed to the disease. The man was promptly sent to the pest-house and no other cases occurred.

THE HEALTH SERVICE OF THE STATE.

The health service of the State consists of the State Board of Health, the local boards of health, and in addition the trustees of townships are given authority to exercise some of the powers of a board of health for the prevention of small-pox and other loathsome and infectious diseases.

The State Board of Health has entered the sixth year of its existence, and a brief review of its work may appropriately be given with a few suggestions as to how its usefulness might be extended. At the time of the Board's creation, municipal sanitation was at a low ebb. Most of the large cities maintained active health organizations, although Sandusky, Zanesville, and others of less size were without a board of health. The great mass of the people paid but little attention to sanitation, or thought of the prevention of disease until the presence of an epidemic aroused them to fitful action. The Ohio State Sanitary Association had been in existence for several years, and had labored faithfully to advance the cause of sanitation, but its published proceedings could reach but a favored few of our people, while it attracted to its ranks principally those who were already converted to the cause—those who stood in least need of sanitary instruction. Chiefly through its efforts the State Board of Health was created, Ohio being the thirty-second State in the Union to establish a State health organization. The Board was organized in May, 1886, and at once entered upon its duties. Recognizing the fact that sanitation is largely a matter of education, and that legislation can not suddenly change the habits of the people, it has devoted itself from the first to disseminating a knowledge of the causes that produce disease, and the measures that should be taken to avoid or prevent them. It was of primary importance, in reaching the masses, that local aids should be secured in every community; but though municipalities had long been granted authority to establish boards of health, it was found that the great majority had neglected to do so; while many of the boards that had been created—called into existence in most cases by an unusual prevalence of some dangerous disease—were without organization, totally unprepared to cope with an outbreak of an epidemic disease, and their members unknown to the pub-

lic, and often to the authorities themselves. The State Board petitioned legislature, and secured the enactment of a law, mandatory in its provisions, establishing a board of health in each city and village having a population of 500 or more inhabitants. Through the efforts of the Board more than three hundred local boards of health have been established. These boards are in close relationship with the State Board, and its advice and directions are in daily demand in regard to questions affecting the public health.

By correspondence, and by means of health circulars and pamphlets, and a sanitary journal published monthly, and sent to members of local boards of health, the health service has been placed on a higher plane than ever before. The majority of the local boards have adopted, and are now enforcing comprehensive health rules and regulations, prepared by the State Board, which have been of the greatest benefit in the prevention of disease. Take the single matter of controlling the spread of contagious or infectious diseases—especially diphtheria and scarlet fever; with a few exceptions there were formerly no systematic efforts on the part of local boards of health to prevent their spread. Now, on the outbreak of one of these diseases in most any of our towns, the first case is reported to the local board of health within twenty-four hours, and often much sooner; a conspicuous colored card, warning the public of the presence of a case of infectious disease, is at once displayed upon the house containing it. A pamphlet giving in plain language full instructions for caring for the patient, for disinfecting his clothing, bedding, etc., so as to preserve other members of the family from the disease, is left at the house; and the head of the household notified that all but adult members must remain strictly at home. These pamphlets are furnished free by the State Board of Health to all local boards, and to all others who may desire them. The superintendent of schools is immediately notified of the name and residence of the patient, and required to exclude from school, until further notice from the board of health, all persons living in the house containing the patient. Should the patient die, a private funeral, as soon after death as possible, is required. Once a week the local boards report to the State Board all cases and deaths from infectious diseases occurring within their jurisdiction; and should this be an unusually large number in any place, inquiry is made as to the probable cause of it and further advice is given, and possibly a personal visit is made by the Secretary or some member of the Board to aid in restricting its spread. The local boards in many places have been making a determined warfare against that greatest of abominations—the uncemented privy vault. Acting under the rules recommended by the State Board the construction of all privy vaults, unless they are made water tight is absolutely prohibited; and to control

this matter, no one is allowed to construct a privy vault without first obtaining a permit from the local board of health. In some places they have succeeded in completely abolishing the old fashioned "hole in the ground" privy. Many other sanitary improvements have been brought about in our towns in the last four or five years through the agency of the local boards of health. The prompt abatement of nuisances, the inspection of school-houses, the inspection of milk and dairies, the proper registration of births and deaths, and other public health measures are being practiced in scores of towns, where a few years ago their enforcement was limited to a half dozen of our principal cities.

The State Board has enlisted many others, besides members of local boards of health, in the cause of sanitation; the medical profession has on all occasions freely aided the Board in its investigations; and has been of the greatest service by placing in the hands of families afflicted with infectious diseases, the Board's printed instructions for preventing their spread. The superintendents of public schools have also joined hands with the State Board of Health in the prevention of disease, the dissemination of sanitary knowledge, and the improvement of the sanitary condition of our school-houses. A large number of them left their work and met in convention with the Board for the discussion of these problems. Much good has also been accomplished by sanitary conventions, which are held semi-annually in different places under the auspices of the Board.

The Board is unable to accomplish many things that are expected of it by the public. The majority believe that the Board has power to abate all nuisances, and to enforce all laws for the protection of health, and are disappointed when they find this is not the case. The health laws of our State are based on the principle of self government, and all cities and villages of over five hundred inhabitants are required to establish a board of health, which board has been granted almost unlimited power for the protection and preservation of the public health. This principle is undoubtedly correct, but its application should be extended to the entire State, so that all citizens may alike have protection, and not be limited to those fortunate enough to live in towns of over five hundred inhabitants. Many cases are referred to the State Board, however, where the local health authorities neglect or refuse to enforce proper health measures. If it is simply ect, it is often possible for the State Board, by calling attention to the matter, to secure the necessary action.

In some cases the local board is hampered by council (in a manner to be hereafter spoken of), so that it can not act; and in a few instances it has happened that such boards, without any good reason, have refused to do their duty. In cases of this kind it would be well to authorize the State Board, not to act for the local board, but to compel it to do its duty.

Such was evidently the intent of the framers of the act establishing the State Board of Health; but there is a weak point in the law which should be cured before it can be made to apply to such cases.

The act creating the State Board of Health provides a penalty for the violation of its rules and regulations, but this penalty is misapplied. Part of section 2 of the act reads as follows:

> It shall be the duty of all local boards of health, health authorities and officials, officers of state institutions, police officers, sheriffs, constables and all other officers and employes of the state, or any county, city or town thereof, to enforce such quarantine and sanitary rules and regulations as may be adopted by the state board of health, and in the event of failure or refusal on the part of any member of said boards or other officials, or persons in this section mentioned to so act, he or they shall be subject to a fine of not less than fifty dollars upon first conviction, and upon a conviction of second offense of not less than one hundred dollars. (O. L., 86, v. 223.)

The penalty provided in the act could be applied to any person named therein who refused or neglected to enforce "such quarantine and sanitary rules and regulations as may be adopted by the State Board of Health," but not for the violation of these rules and regulations by persons not named therein. For instance, if the State Board of Health adopted a rule prohibiting the shipment of the bodies of persons who have died of small-pox, the penalty would apply to the authorities who permitted such body to be transported, and not to the undertaker in charge of the body, nor to the carrier that received and shipped it. But there is no law in Ohio which prohibits the shipment of such bodies, and it would evidently be unjust to punish those who had permitted a thing to be done which they had no authority to prevent. This defect in the act under which the State Board of Health is working could be remedied by applying the penalty to the person who commits the act in violation of the rules the Board is authorized to adopt. The local authorities would then be able, and should be required to enforce the rule of the State Board prohibiting the transportation of certain dead bodies, or any other sanitary or quarantine rule of a reasonable character; and if the police judge or mayor and justice of the peace were given final jurisdiction in all suits brought for violation of the rules of the Board, a speedy settlement of all such cases could be reached.

There is one other lame place in the law establishing the Board; that is in regard to vital statistics. The Board has been given "supervision of the State system of registration of births and deaths," but the method of collecting births and deaths is fixed by statute; and as this method is radically wrong—for reasons given in previous reports—there must be a complete change in the system of registering births and deaths before any useful results can be obtained from the collection of vital statistics.

LOCAL BOARDS OF HEALTH.

There are now three hundred and fifty-seven local boards of health in Ohio. Each board is composed of six members, who are appointed by council, the term of office being so arranged that two members are appointed annually. The mayor, by virtue of his office is president of the board. The board is required to appoint a health officer, and may appoint a clerk and physicians for the care of the sick poor, and such other persons as may be in need.

This plan of organization works fairly well in the majority of places, but is a complete failure in others. On account of the time required by the duties of the office, but more especially from the opposition, and frequently the enmity, encountered in strictly enforcing the health laws and ordinances, business and professional men are often unwilling to accept the office. If members are appointed who have no knowledge or interest in sanitation, meetings of the board will probably be held semi-annually, or not at all, unless an epidemic comes to remind them that they have sworn to act as guardians of the health of their townsmen. They are found asleep on duty, which, though it may result in loss of life to many, can not be punished.

Several villages, one a county seat, have not established boards of health because the requisite number of men could not be found who would consent to act as members. As no man can be compelled to accept this office, council is required by statute to do that which may be impossible. Such cases are happily few, and probably may safely be left to take care of themselves. Residents of country districts receive little or no protection from the State against the spread of infectious diseases, while our reports show that a large number of cases of scarlet fever, diphtheria and typhoid fever occur in the country and in unincorporated villages. In the prevention of small-pox the township trustees have been given the authority of a local board of health. It is far more important that they should not only be given authority, but that it should be made their duty to prevent, as far as possible, the spread of diphtheria, scarlet fever, and other infectious diseases which are constantly occurring. We would therefore renew our recommendation that the board of trustees of each township be constituted a board of health, and that full authority be given them to enforce measures necessary for the prevention of disease.

The efficacy of local boards of health is often crippled by the lack of sympathy and support of council. These bodies, which should work harmoniously together for the common weal, are in fact frequently at loggerheads, greatly to the hurt of the public. The most common cause of dis-

agreement is the payment of the expenses of the board. Section 2140 R. S. provides that it shall be the duty of council to pass the necessary appropriation ordinance to pay the expenses incurred by the board of health in the discharge of its duties. Council is empowered to levy, subject to certain restrictions, and set apart the necessary sum for the payment of such expenses. The special levy authorized for this purpose is for sanitary *and* street cleaning purposes. The result is that the streets usually receive the bulk of the appropriation, and little is left for the expenses of the board of health. The board of health is authorized to fix the salaries of its officers, but council, without authority, has in some places reduced this sum so that efficient officers can not be secured. In some instances council has arbitrarily refused to pay any expenses of the board of health, and thus entirely defeated the purposes of the board. For these, and other reasons that could be given, it would be greatly to the benefit of the health service if council were required to levy and set apart a sanitary fund sufficient for the necessary expenses of the board of health, against which the board of health could issue warrants.

Local boards of health meet with many nuisances annoying and detrimental to the health of people living within the corporation, which are committed just beyond the corporation line, and out of the board's jurisdiction. These nuisances, which usually arise in warm weather, may require speedy abatement to prevent disease. We would suggest that justices of the peace should be given final jurisdiction in such cases; and that the township trustees, as previously recommended, should be authorized and required to abate nuisances within the township but outside of municipal limits.

Secretary's Report.

Abstracts of Proceedings of the Board at its Meetings During the Year Ending October 31, 1891.

JANUARY MEETING.

A regular meeting of the State Board of Health was held in Columbus on January 28 and 29, 1891.

Present: Drs. Hoover, Sharp, Wise, Miller, Conklin and Prof. Nelson.

The minutes of the last meeting were read and approved.

The Secretary presented his quarterly report, with abstracts from the correspondence of the office during the quarter.

Dr. Hoover made a report of a visit to Ashville on account of scarlet fever at that place.

Motion made to adopt the Secretary's report.

Motion amended to incorporate Dr. Hoover's report with the Secretary's.

Motion adopted as amended.

Prof. Nelson submitted a report from the committee appointed to solicit a joint meeting of the Board and State Teachers' Association. He stated that the Secretary of the Association had invited the Board to delegate one of its members, or some other person, to present a paper on a sanitary topic at an evening session of the Association, and promised that the entire evening should be devoted to its discussion.

It was decided, after discussing the proposition, that the Board could not accept it; and the Secretary was instructed to write to the Secretary of the Association to this effect, and thank him for the courtesy extended to the Board.

As Chairman of the Finance Committee, Prof. Nelson reported that Dr. Hoover, the Secretary and himself had secured permission to create a deficiency for a sum not exceeding five hundred dollars.

The Secretary stated that Martin & Son had refused to continue to send the Board vaccine virus with the privilege of returning unopened packages, and asked for instructions for future arrangements. He was instructed to procure virus by telegraph order when it was needed.

The President appointed Dr. Miller Chairman of the Committee on Adulteration of Food, Drinks and Drugs.

Dr. Wise made some statements in regard to the injuriousness of public exhibitions of hypnotism, and suggested that the Board should take measures to have it suppressed in our State.

On motion Dr. Wise was appointed a committee of one to draft a bill for the suppression of exhibitions of hypnotism in Ohio, and to secure its introduction before the present General Assembly.

The Secretary stated that Mr. Kean, Representative from Carroll county, had called at the office and requested that the Board recommend some change in the laws regulating the establishment of local boards of health. In Carrollton they could not succeed in finding six men who would serve as members of a board of health, and Mr. Kean suggested that the law be amended so that the council could act as a board of health.

The matter was informally discussed by the members of the Board, the plan of Mr. Kean meeting with many objections.

Dr. Hoover spoke of the importance of the work of the Legislative Committee, and named as its members Dr. Wise, Prof. Nelson and Dr. Miller.

Prof. Nelson gave notice that at the next meeting he would offer an amendment to the by-laws or rules of the Board relating to the Standing Committees.

The Secretary stated that the well at the Deaf and Dumb Asylum, which had been condemned by the Board, was still in use; that the Trustees had asked for an appropriation to re-plumb the entire building. The matter was referred to the Secretary with instructions to consult the Attorney-General, and to have another analysis of the water made before taking final action.

The Secretary recommended that a joint meeting of the Board and Superintendents of Schools be held in April.

On motion of Dr. Conklin, the Secretary was instructed to arrange for a conference of the Superintendents of Schools and the State Board of Health, at the time of the April meeting of the Board. Dr. Miller extended an invitation to hold the meeting in Cleveland, and suggested that it should be at the time of their spring vacation. On motion, the

invitation was accepted. The Secretary was instructed to arrange the program.

Dr. Hoover spoke of the law providing for the appointment of inspectors of nuisances, and stated that the Commissioners of Franklin county had taken no action upon the complaint of the Board in regard to the nuisance affecting the water supply of the city of Columbus. Dr. Hoover moved that the matter be referred to the Legislative Committee with instructions to secure an amendment so that the law should be mandatory in its provisions. Carried.

Dr. Wise stated that Senator Hart had requested that the Board should adopt a rule regulating the time of quarantine in infectious and contagious diseases. The matter was referred to the Secretary, with instructions to submit rules to the Board for approval.

There being no further business, the Board adjourned to the lecture room of the Congregational Church, to attend the Convention of the State and Local Boards of Health, held January 29 and 30, 1891, where the following program was given:

PROGRAMME.

1. Introductory Remarks—
   Dr. Thos. C. Hoover, President of State Board of Health, Columbus.
2. The Inspection of Schools and School Houses—
   Dr. T. T. Church, Health Officer, Salem.
3. The Collection and Disposal of Night Soil and Garbage in Villages and Small Cities.
   Dr. Wm. H. Bell, Health Officer, Clifton.
4. What may Boards of Health do to Prevent Typhoid Fever?—
   Dr. H. C. Houston, Health Officer, Urbana.

SECOND SESSION.

1. The Hog-pen Nuisance—
   Geo. P. Hunter, Esq., Warren.
2. The Use and Abuse of Disinfectants—
   Dr. C. O. Probst, Secretary of State Board of Health, Columbus.
3. The Evolution of a Board of Health—
   Dr. T. Clarke Miller, Health Officer, Massillon.
4. Does Sanitation Pay?—
   E. T. Nelson, M. A., Ph. D., Member of State Board of Health, Delaware.

THIRD SESSION.

1. The Inspection of Dairies and Milk Supplies—
   Dr. G. A. Collamore, Health Officer, Toledo.
2. Vaccination—
   Dr. S. A. Conklin, Member of State Board of Health, Canton.
3. The Regulations of Burials for the Prevention of Infectious Diseases—
   Dr. H. T. Sutton, Health Officer, Zanesville.

APRIL MEETING.

The April meeting of the Board was called at Bellaire, on the evening of the 1st; arrangements having been made to hold a public session on the night of the 2d to consider the questions of sewerage and water supply of Bellaire.

Present: Dr. Hoover, Prof. Nelson, Dr. Conklin and the Secretary.

On the 2d, at 9 A. M., the meeting was called to order by the President, Dr. Hoover. The Secretary announced that a quorum was not present. Prof. Nelson stated that a majority of the members of the executive committee was present, and asked the Chair if this committee could properly transact the business to come before the Board.

The Chair decided that such business as the executive committee could properly transact during the interim between meetings could be transacted at this time.

The Secretary presented a communication from Mr. Tuttle, of Chicago, requesting permission to disinter and remove the dead bodies of his children from Zanesville to Chicago. These children had died of diphtheria, and the body of one of them had been brought from Chicago to Zanesville for burial, and through a false certificate, and the opening of the coffin, had introduced the disease into Zanesville.

On motion, the Secretary was instructed to say in reply to Mr. Tuttle's request that inasmuch as the rules of the Board relating to the transportation and burial of dead bodies had been violated by him on a former occasion, his request would not be granted.

A communication from Dr. Formento, of the State Board of Health of Louisiana, was presented, in which the writer stated that their Board was considering the adoption of a rule requiring cases of membranous croup to be treated as infectious, and requesting the opinion of the Ohio Board as to the advisability of adopting such a rule.

The Secretary was instructed to say that it was the opinion of mem-

bers of the Board that membranous croup should be placed under the same restrictions as diphtheria.

The Secretary made a full report of his action to close the well at the Deaf and Dumb Asylum, and of the action of the Governor to the same effect.

Dr. Conklin moved that the Board serve notice on the trustees of the Deaf and Dumb Asylum to close their well by May 1st.

Prof. Nelson called for a decision of the Chair as to the right of the executive committee to act on this question.

The Chair decided that the committee had authority to take such action. The motion was then carried.

On motion the Secretary was instructed to consult the Attorney-General in regard to the authority of the executive committee to act for the Board in ordering the well at the Deaf and Dumb Asylum closed.

Mr. Wilson, of Bellaire, was introduced and made some remarks on the sewerage of Bellaire.

The committee then adjourned.

Members of the Bellaire water-works board escorted the Board to points of interest in connection with the water supply; and later, members of the local board of health conducted the Board over the district of the proposed new sewer.

In the evening a public meeting was held in the city hall, when the questions of sewerage and water supply were freely discussed. The following report of the meeting, including the recommendations offered by the members of the State Board of Health, is clipped from the Daily Independent for April 3, 1891:

PUBLIC MEETING OF THE STATE BOARD OF HEALTH, HELD IN BELLAIRE, APRIL 2, 1891.

A public meeting of the State Board of Health was held in the city hall last evening. Members of the council, the water-works board, the local board of health, and other citizens, were there to greet the members of the State Board.

Dr. Hoover, President of the Board, opened the meeting by explaining the object of the Board's visit to Bellaire. He said the Board had come here, not because it was considered that Bellaire was in need of an investigation by the Board of Health, but because the Board quarterly visited some of the cities of the State, and were specially interested at this time in cities getting their water supply from the Ohio river.

He explained briefly the purposes of a State Board of Health, and referred to some of the things it had accomplished. Since coming here, he said, the Board had found that a question of great importance to the health of the city was the subject of much discussion. This was the question of the introduction of sewerage for the Fifth ward, and more particularly, what was to be done with the sewage. Dr. West, the health officer, was called upon to make a statement in regard to this.

Dr. West said that Bellaire had a bad reputation for healthfulness, which was not altogether deserved. He did not question the fact that it had a bad water supply,

hough this was not greatly worse than the majority of Ohio river towns. There had been no bad epidemics in Bellaire, he said, in the past eight years, except an epidemic of fevers, which he considered simple continued fever. Prior to this the city had suffered with a bad epidemic of diptheria, though the cause of this had not been clearly established. The death rate of Bellaire, he stated, was not large, and had decreased in the past three or four years. At one time the First and Second wards had been the most unhealthy parts of town, but since the introduction of sewerage and other improvements this had been changed. He was inclined to think the upper end of the city the most unhealthy. He advocated sewerage for the Fifth ward, and thought some change should be made in the water supply.

Dr. Probst, Secretary of the State Board, said he could corroborate what Dr. West had said in regard to the comparatively low death rate of Bellaire. He said it was a little below that of Columbus and Dayton, and considerably below that of Cincinnati and Cleveland. But in judging of what the death rate should be, the zymotic diseases—those that were preventable—should be considered. The death rate from typhoid fever had special significance in judging of the purity of the water supply. Bellaire in 1888 had reported 8 deaths from typhoid fever, 7 in 1889, and 12 in 1890. For the past three years this would give for Bellaire a typhoid fever death rate of 9 per 10,000 inhabitants. This, he said, was much too high; as high as in Cincinnati, where the death rate was considered excessive, and more than three times as high as in New Orleans, a city without sewers, but with a water supply which could not be polluted by sewage, as it was all from cisterns above ground. He said that whenever a city had substituted a pure for an impure water supply there had always been a great reduction of the deaths from typhoid fever.

Prof. Nelson, a member of the State Board, said the members, since coming to the city, had been over the entire ground, and had endeavored to fully inform themselves of the situation. He made a clear statement of the conditions found, and said the question narrowed itself down to the disposal of the sewage from the Fifth ward so as not to pollute the water supply. He was decidedly opposed to stopping the sewer at Indian run. He said the increased sickness in the Gravel hill territory was, in his opinion, due to the great pollution of the soil there, which would be remedied by proper sewerage.

Mr. James Wilson said that the question of sewerage was of the greatest importance to the citizens of Bellaire. The sewer of the Fifth ward would undoubtedly be built; but he did not favor making Indian run a receptacle for sewage. He thought the solution of the question was to carry the sewer across the run, and then take it to the river below the mouth of the run. He did not believe the water supply was greatly polluted, and especially by sewage from Wheeling.

Mr. Gallaher said the Fifth ward was undoubtedly having a considerable amount of sickness, more than other parts of the city. He once thought this might be due to the water, but he was now satisfied it was from lack of sewerage. He said he could count twenty-five privies in the alley back of him; and he thought the residents of the ward would be in danger until the sewer was built. He doubted if the sewage in Indian run would pollute the water supply, but thought it was much better to change the location of the water-works than to chance the system of sewerage. He said the Fourth ward sewer had been emptied into Indian run without a protest.

Mr. Walters said he wanted to state that that had not been done without a protest; that the water-works board had entered a formal protest against its being done.

Mr. Barnard said he decidedly protested against emptying the sewage into Indian run. "Why," said he, "I once had a man construct a mill race in this run, and the man came to me and said, 'Mr. Barnard, I think you are a great fool to put a race in such a place where I have to go to the river when I want to water my horse.' Now, a stream where a man could not water his horse for five weeks will surely not have water enough to carry away the sewage emptied into it."

Mr. Norton, city engineer, was called upon to make some statements in regard to

the proposed sewer. He said it would be an easy matter to carry the sewer down Indian run to the river.

Dr. Probst then read the following recommendations, which had been adopted by the State Board of Health:

To the Council, Board of Water-Works, and Citizens of Bellaire:

Having examined the water supply and sewerage system of your city, and also the sewerage proposed for the Fifth ward, we, as representatives of the State Board of Health, respectfully present for your consideration the following plan for obtaining a purer water supply, and for the disposal of your sewerage:

It had been reported to us that at a depth of about 1,600 feet your city is underlaid with a bed of artesian water. We would suggest that steps be at once taken to learn the probable supply this would afford, and its character as to purity and hardness, with a view of securing a supply of artesian water at no distant date. The Royal Rivers Pollution Commission, after a careful examination of English streams, arrived at the conclusion that no stream receiving sewage affords a perfectly safe source of water supply; and that there was not a stream in England long enough to be purified of sewage emptied into it at its head. But if it should be found impossible to secure a supply of artesian water, we would recommend that a pipe be extended from your present pumping station to a point above the location of the steel works. Indian run, even with the sewage kept out of it, will always endanger your water supply with the intake at its present site, while this danger will be very greatly increased by emptying sewage into it. As Indian run is reduced to the merest rivulet in dry weather, we would further recommend, to avoid creating a nuisance, that a sewer be extended along the course of the run, emptying into the Ohio river below the mouth of the run, this sewer to receive all the sewage from the Fourth ward system, and also all of the sewage of the proposed system for the Fifth ward.

We recommend the plans of the proposed system made by your engineer, except that we would advocate that all main sewers should have ventilating openings at short distances.

Dr. Hoover stated that the State Board of Health would gladly undertake the examination of the river water at different points to determine where the purest supply could be found.

After some discussion by Mr. W. M. Reed, Mr. H. G. Wilson, and others, the meeting adjourned.

SECRETARY'S REPORT PRESENTED AT THE APRIL MEETING.

Mr. President:

Your Secretary begs to offer the following report of the work of the office during the months of February and March, or since the last meeting of the Board.

The stenographic report of the proceedings of the joint meeting with health officers was received early in February, and I thought best to publish this in the Record, making a double number of it. Five hundred extra copies were printed—twenty-five hundred in all. These were distributed as usual, and in addition, copies have been sent to superintendents of schools of all cities and most villages, and to all members

of the Legislature. One thousand reprints of Mr. Hunter's paper on "The Hog-pen Nuisance" were secured, and a copy sent to the mayor of each city and village of over four hundred inhabitants.

Letters were received from the health officer and township trustees at Urbana, requesting me to visit the small-pox patients confined at the camp-meeting grounds near Urbana, and to advise what should be done with the building in which they were confined. Representative Taylor, of Urbana, called at the office with the same request. I went to Urbana, and with the health officer, the attending physician, and one township trustee, visited the place where these patients were quarantined. I found them in an old one-story building of some ten or twelve rooms, cheaply constructed for camp-meeting purposes during the warm weather. A number of other buildings of the same character were close to it. The building was very open, and it would have been impossible to have disinfected it by fumigation. As thousands of people visit these grounds annually, I made a written order to the Urbana Camp-meeting Association to have the building torn down and destroyed by fire. I also made a written order to the township trustees for the disposition of the effects of the patients, directing the disinfecting to be done under the supervision of a competent person, and suggesting Dr. Houston, Health Officer of Urbana, for that purpose. As one of the patients was still undergoing desquamation, I directed the trustees to maintain quarantine until this patient had fully recovered.

I went to Cleveland to consult Dr. Miller relative to the program for the proposed joint meeting of the Board and superintendents of schools. The program was completed, and a number of superintendents of schools and health officers were requested to present papers; but owing to the short time for preparation, and from other causes, I was able to secure but three persons for papers. After consulting Dr. Hoover, and writing to each member of the Board, it was decided to postpone the Cleveland meeting until a more favorable time, and I was instructed by the President to call the meeting at Bellaire.

I consulted the Attorney-General in regard to the steps to be taken to close up the well at the Deaf and Dumb Asylum.

He advised me to lay the matter before the Governor, which I did. The Governor expressed himself as strongly opposed to the action of the trustees in neglecting to close the well, and said he would immediately call their attention to the matter. In his letter to the trustees, which I read, he virtually commanded them to close this well, which, as he stated, had been condemned by the State Board of Health, whose judgment should not be questioned. This letter led to the appointment of a committee, by the Board of Trustees, consisting of Dr. Sterrett, who is a member

of the House of Representatives, Mr. Kinnear, of Columbus, and Superintendent Knott, who called upon me and requested the Board to reconsider its action in regard to closing the well. It was represented that the change would entail considerable expense for change of pipes, and an annual water rent of eight hundred dollars.

I went with the committee before the Finance Committee of the House, and presented the reasons for condemning the well.

The Finance Committee agreed to recommend an appropriation for a new water supply, but subsequently, for reasons not known, rescinded this action.

JUNE MEETING.

The meeting was called to order at 7:30 P. M., June 24, Dr. Hoover in the chair.

Present: Drs. Sharp, Wise, Miller and Prof. Nelson.

The minutes of the January meeting, and a report of the April meeting at Bellaire, at which a quorum was not present, were read and approved.

The Secretary presented his report of the two quarters' work, from January to June, which were read and approved and ordered filed for publication in the annual report.

Dr. Hoover presented a verbal report of his visit to Barnesville, whither he was called on account of diphtheria and scarlet fever reported there. The report was approved, and the reporter requested to place it in writing.

Prof. Nelson reported upon an investigation of diphtheria at the Girls' Industrial Home, near Delaware. Report approved and ordered filed for publication.

Prof. Nelson presented a report on an investigation of the water supply of Martin's Ferry. Report approved and ordered filed, and a vote of thanks tendered Prof. Nelson for the same.

The Secretary presented a report of an investigation of the water supply and sewerage of the Central Insane Asylum, made by Dr. Hoover and himself. (See Secretary's report.) The report was approved.

The question of closing the well at the Deaf and Dumb Asylum was taken up for consideration. A motion was made by Dr. Sharp, which was duly seconded, to authorize the Secretary to have a sample of water from the well at the Deaf and Dumb Asylum analyzed, and if found impure to order the well closed on or before August 1, 1891.

Prof. Nelson moved to lay on the table until next session. Carried.

A motion to take Dr. Sharp's motion from the table prevailed. Dr. Sharp presented the following resolution as a substitute for his former motion:

Resolved, That the Secretary be instructed to have analyses made, by two chemists, of the water of the well at the Deaf and Dumb Asylum, and if said water be found impure, the said well be ordered closed on or before the 1st day of August, 1891.

After some discussion a yea and nay vote was called for. The vote resulted in five yeas and no nays, and the motion was declared carried. The Secretary presented a report of an investigation of the sewerage system proposed for Ashtabula. (See Secretary's report.) The report was approved.

After discussion, Dr. Sharp offered the following resolution:

Resolved, That it is, in the opinion of the State Board of Health, unsafe to construct a system of sewerage emptying into the same body of water from which the public water supply is secured.

The resolution was amended by adding the words "unpurified sewage" after the word "emptying," and was then adopted as amended. Dr. Sharp moved that a copy of the resolution be sent to the board of health of Ashtabula, and that the Secretary be instructed to recommend to the board that the sewage of Ashtabula should be purified before entering the lake; and that the intake pipe of the water-works should be extended into the lake at least two miles. The motion was seconded and carried.

The Secretary presented the following rules governing the duration of quarantine in cases of infectious diseases:

RULES GOVERNING THE DURATION OF QUARANTINE.

For the protection of the public health it is hereby ordered that the following diseases shall be subject to quarantine for the periods named, unless a certificate is furnished by a reputable physician that the patient is free from infection, and that disinfection has been properly carried out, to-wit: For small-pox, diphtheria and scarlet fever, 40 days; for measles and whooping-cough, 30 days.

In all cases, except in whooping-cough, the duration of quarantine shall be reckoned from the day of onset or commencement of the disease; and for whooping-cough it shall be 30 days from the cessation of the characteristic fits of coughing.

The word quarantine, as here used, shall mean the complete isolation of the sick from all but the attending physician and necessary attendants, and the confinement to the house of all children, whether sick or well,

unless otherwise ordered by the local or State health authorities, until the termination of the quarantine.

In all cases of sickness from the diseases above named, quarantine shall be maintained until the patient, the sick room and all its contents shall have been properly disinfected.

The rules were adopted as read.

The report on the water supply and sewerage of the Insane Asylum at Columbus was taken up for discussion. Dr. Wise moved that the Secretary be instructed to present recommendations embodying those contained in the report of the committee. Carried.

The Secretary presented recommendations for changes in the sewerage, water supply, plumbing, etc., of the Columbus Insane Asylum. The recommendations were adopted, and the Secretary was instructed to transmit a copy of the report and recommendations to the trustees of the Central Insane Asylum.

The Secretary read the following joint resolution of the Legislature relating to an investigation of the pollution of the Ohio river:

WHEREAS, The water supply of the towns and cities of the State bordering on the Ohio river is rendered impure and unhealthful by the sewerage and excreta emptied into the stream from the numerous cities upon both sides of the river; and,

WHEREAS, In consequence of this pollution a scourge of diphtheria and typhoid fever has swept over many of our cities in Eastern Ohio, resulting in much sickness; therefore, be it

Resolved by the General Assembly of the State of Ohio, That the State Board of Health be requested to prepare a report to be submitted to the General Assembly, as to the sources of greatest danger from the causes above recited, and also what investigation would be required and what action should be taken, in order to secure a purer water supply for the people of the river counties.

Adopted April 8, 1891.

The scope and character of the work required was discussed by different members. The President appointed Dr. Sharp a committee to visit all towns obtaining a water supply from the Ohio river, and to report upon the sources of contamination to which the water supply of each was subjected. The Secretary was authorized to accompany him. The Secretary was authorized to arrange for the chemical and biological examination of samples of Ohio river water at such intervals and from such points as he might deem best.

The Secretary was instructed to correspond with the State Boards of Health of Pennsylvania, West Virginia, and Kentucky, with a view of arranging for a joint meeting for the purpose of discussing the question of the pollution of the Ohio river, and its prevention.

On motion, the Secretary was instructed to secure the re-introduction

in the Legislature of the bill to regulate hypnotism, formerly offered by Dr. Wise.

The following resolution by Dr. Wise was adopted:

WHEREAS, Undrawn poultry are continually exposed for sale in our markets, and we know from scientific investigation that the intestines contain many gases and germs which favor rapid decomposition, rendering the flesh unwholesome and deleterious to health; therefore, be it

Resolved, That we recommend to the Dairy and Food Commissioner that such action be taken as will prevent the sale of undrawn poultry.

A communication was presented from Mr. Strawn, C. E., of Salem, Ohio, with a copy of a proposed bill for regulating the pollution of streams, and the construction of water-works. Referred to Dr. Sharp, Chairman of the committee on Water Supplies and Sewerage.

Letters were read from the health officer of Felicity in regard to a corpse shipped from Cincinnati. The cause of death was given as pneumonia, but evidence was given to show that diphtheria had been the cause of death. The Secretary was instructed to fully investigate the matter.

The question of transporting the bodies of persons that had died of diphtheria was brought up for discussion. On motion, rules 1 and 2 of the rules for the transportation of dead bodies were amended so as to read as follows:

RULE 1. The transportation of bodies of persons dead of small pox, Asiatic cholera, leprosy, typhus fever, yellow fever, or *diphtheria*, is absolutely prohibited.

RULE 2. The bodies of those who have died of anthrax, scarlet fever, puerperal fever, typhoid fever, erysipelas, measles, and other contagious, infectious, or communicable diseases, must be wrapped in a sheet thoroughly saturated with a strong solution of bi-chloride of mercury, in the proportion of one ounce of bi-chloride of mercury to a gallon of water; and encased in an air-tight zinc, copper, tin, or lead lined coffin, or in an air-tight iron casket, hermetically sealed, and all inclosed in a strong tight wooden box; or the body must be prepared for shipment by being wrapped in a sheet and disinfected by a solution of bi-chloride of mercury as above, and placed in a strong coffin or casket, and said coffin or casket encased in a hermetically sealed (soldered) zinc, copper or tin case, and all inclosed in a strong outside wooden box, of material not less than one inch and a half thick.

The Secretary presented the following resolution, which on motion was adopted:

Resolved, That all cases of "pseudo-membranous laryngitis," "membranous croup," "croupous diphtheria," or "diphtheritic croup," shall be classed with the diseases required to be reported to health authorities; and that such measures shall be taken to prevent contagion from such cases as are required in other contagious diseases.

A number of communications were presented, after which, no further business presenting, the Board adjourned to meet in October.

SECRETARY'S REPORT PRESENTED AT THE JUNE MEETING.

Mr. President:

I beg leave to offer the following report for the period intervening between the Bellaire meeting and the present:

THE SEWERAGE OF SALEM, OHIO.

In response to a request from the Board of Health of Salem, I visited that city April 3d, in the interest of a sewerage system for Salem.

The proposition to introduce sewers had raised considerable opposition. The newspapers had interviewed most of the prominent men of Salem, and published their views on the subject. Council was divided on the question, and "Sewers or no sewers" was to be submitted to the vote of the people soon after my visit.

The city is provided with water-works, and the disposal of waste water has become a serious matter. In some houses where baths and laundries are in use, waste water, except from water closets, was being drained into the street gutter.

Several private sewers had been constructed, and were draining all waste matter, including that from water-closets, into a valley running through the city.

The necessity for a system of sewerage in Salem is undoubtedly great, but a serious obstacle is met in the difficulty of providing for suitable disposal of their sewage.

Arriving at Salem, I was met by the Health Officer, Dr. Church, who conducted me to the office of Mr. French, City Engineer. Mr. French explained by drawings the proposed system, and we then walked over most of the sewer district. The system proposed is the separate system with trunk sewer 24 inches. In the same trench drain tile is to be laid for sub-soil drainage, and for connection with cellars. Manholes for ventilation are provided at an average of every 300 feet; and 70 automatic flush tanks, capacity 200 gallons each, will discharge once in 24 hours.

The length of the entire system was to be 23½ miles; and the total estimated cost, $117,876.00, or about 47½ cents per front foot; cost for cellar drain sewer 15 cents per front foot.

The outlet selected was at the junction of two small streams northwest of the city, and about one-half mile from any dwelling-house. This stream in April was about 8 to 10 feet wide and 3 to 4 feet deep. In hot weather it is often nearly dry. It flows through fine pasture land, and I was informed that farmers along the stream would undoubtedly contest the emptying of sewage into it. The soil in the neighborhood of the proposed outlet is loose sand and gravel, with a thin layer of loam on top.

In the evening I attended a meeting of council and citizens, and was invited to address them on the question of sewerage. I advocated the necessity of providing a system of sewerage, more urgently demanded on account of the increased amount of water furnished by their water-works. I also called attention to their typhoid fever death rate, which I found had been quite high for the last three years. I opposed emptying the sewage into the creek in an unpurified state, and suggested that at a comparatively small cost excellent filter beds for disposing of sewage by intermittent downward filtration could be made near the banks of the creek, the effluent to be discharged directly into it. I regret to say that the proposition for sewerage was defeated at the election following, but the board of health hope for a more favorable result next year, and desire the assistance of the State Board in pointing out a proper and not too costly method of disposing of the sewage.

DESTRUCTION OF A PEST-HOUSE AT URBANA.

April 20th, having been informed that the pest-house at the Urbana camp-meeting grounds had not been destroyed according to a former demand, I sent the following order:

OFFICE OF STATE BOARD OF HEALTH,
COLUMBUS, OHIO, *April* 20, 1891.

MR. R. S. PEARCE, *Secretary Urbana Camp Association, Urbana, Ohio:*

DEAR SIR: I am informed that the building belonging to your Association, and recently occupied by small-pox patients, has not been destroyed according to recommendations from this office under date of March 3, 1891.

As we consider it essential for public safety that this centre of infection should be completely destroyed, you are hereby notified to burn, not later than ten days after the receipt of this order, the building situated upon the grounds of your Association which was occupied by small-pox patients.

By order of the State Board of Health.

C. O. PROBST, *Secretary.*

On the 26th of April a letter was received from Mr. Pearce requesting to know by what authority the State Board of Health ordered the destruction of property without providing compensation therefor. I referred this letter to the Attorney-General, requesting his opinion of the authority of the State Board of Health to burn this building. I received from him the following answer:

OFFICE OF THE ATTORNEY-GENERAL, STATE OF OHIO,
COLUMBUS, *May* 12, 1891.

C. O. PROBST, M. D., *Secretary Ohio State Board of Health, Columbus, O.:*

DEAR SIR: I have examined your communication of the 25th ultimo in reference to the power of the State Board of Health to order the destruction of a building by fire,

which has been infected with the small-pox, and which can not be successfully disinfected, as carefully as I have had time to do.

Without going into the details of the matter, and citing particular cases which sustain my opinion, I will say, that in my judgment, the authorities would justify you in taking such steps.

Very respectfully yours,

(Signed,) DAVID K. WATSON,
Attorney-General.

Armed with this opinion, I went to Urbana and met the executive committee of the camp-meeting association. They explained that they did not wish to resist the order of the Board, but that the quarantine instituted by the township trustees had never been raised, and that they had no right to go upon the premises. They wanted the trustees to burn the building and pay for it. After some discussion, and by the aid of the Attorney-General's opinion, the matter was harmoniously adjusted, the directors agreeing to burn the building. I informed them that the Attorney-General had said that he was of the opinion that the Legislature would pay a just claim for damages, and that he would help work for the passage of such a bill. By request of the directors I selected three appraisers—Mr. Taylor, representative of Champaign county, and two citizens of Urbana, having no connection with the association, and went with them to view the building. They valued it at $300.00.

The old couple living in the building, who had had small pox, were with great difficulty found quarters, as every one was afraid of them; but I finally succeeded in finding them a house. Their clothing and household effects were fumigated a second time. I furnished virus to vaccinate the men engaged to tear down the building, but at the prospect of vaccination they refused to do the work; and the old man who lived in the house and another man who had had small-pox did the work.

On June 4th Dr. Hoover and myself, by invitation of the secretary, met the entire board of directors on the grounds of the association, and made an inspection of its sanitary condition. The small-pox building, including all out-buildings and pavements around it, had been completely destroyed. The following reports were made to the board of directors, who requested them for publication:

OHIO STATE BOARD OF HEALTH,
COLUMBUS, O., *June* 6, 1891.

Board of Directors U. C. A., Urbana, Ohio:

GENTLEMEN: Having found it necessary to order the destruction of a building located upon your grounds, on account of its infection by small-pox, we are pleased to report that, upon inspection made June 4, 1891, we found that this work had been most thoroughly done. The entire building, out-houses and walks have been completely

destroyed by fire, and nothing remains which by any possibility could convey the contagion of small-pox.

Very respectfully,

(Signed,) THOS. C. HOOVER, M. D., *President.*
C. O. PROBST, M. D., *Secretary.*

OHIO STATE BOARD OF HEALTH,
COLUMBUS, O, *June* 6, 1891.

Board of Directors U. C. A., Urbana, Ohio:

GENTLEMEN: Having at your request made an examination of the sanitary condition of the grounds of the Urbana Campmeeting Association, we beg to submit the following report:

The grounds, consisting of some 25 acres of forest land, located about two miles from Urbana, afford a most delightful place for sojournment during warm weather. The buildings are situated upon a gentle slope, insuring perfect drainage, and the soil is of such character that the hardest rains in summer leave it wet but a very short time. The water supply is from two large springs and several wells located at different points about the grounds. As the greatest possible care is taken to prevent soil pollution, and as the wells and springs are thoroughly protected from surface drainage, the water supply is undoubtedly of great purity.

No privy vaults or cesspools are allowed upon the grounds; and all excrement is received in boxes, covered with dry earth and removed daily. All garbage is hauled promptly away in tight barrels, and none is permitted to be placed upon the grounds. Rigid police inspection is kept up during camp-meeting, and strict cleanliness enforced.

We are pleased to state that the sanitary arrangements of the camp are excellent throughout, and well calculated to insure a healthful resort in summer weather.

(Signed,) THOS C. HOOVER, M. D., *President.*
C. O. PROBST, M. D., *Secretary.*

DIPHTHERIA AT THE GIRLS' INDUSTRIAL HOME.

Diphtheria having been reported at the Girls' Industrial Home, near Delaware, Prof. Nelson was appointed to investigate the matter, and submitted the following report:

DELAWARE, O., *May* 5, 1891.

HON. T. C. HOOVER, M. D., *President Ohio State Board of Health:*

SIR: Following instructions received from you and dated May 4, 1891, I have spent the day at the Girls' Industrial Home in this county, investigating an epidemic of diphtheria and the present sanitary condition of the Home. A committee of the Board of Health, together with the Secretary, made a full investigation of the Home on August 23, 1890. In the report of that committee published in the Fifth Annual Report, page 82, there will be found a descriptive account of the grounds, buildings, out-buildings, hospital, sewers and water supply. Hence it will not be necessary to discuss these matters in this report except so far as they are connected with the present investigation.

Cottage No. 8, Miss Wilcox matron, stands upon a slight elevation on the north side of the grounds, and a few hundred feet east of the main line of cottages. It faces to the south down the avenue, though with a free exposure to the air and the light in every direction. It was planned by Mr. Frank Packard, architect of Columbus, Ohio, is the last cottage erected and, in very many respects, the best of the series.

In this building Kittie Burkholder, of Wayne county, a bright young girl 16 years of age, died of diphtheria on Friday, April 17th; while Amanda Ruby, of Harrison county, fourteen years of age, died of the same disease on the morning of the 18th. Four of the other inmates have been down with the disease but are now convalescent. Several others may have had diphtheria in a very mild form. The following facts bear more or less directly on the etiology of the present epidemic:

New girls are being received at the institution almost daily and are at once assigned places in the several cottages. Additions were made to the family in cottage No. 8 on February 25th, March 2d and March 14th of this year. As is well known commitments to this institution are on account of incorrigibility and the minor crimes. The girls have not come from the best homes in the State nor those in which sanitary conditions are the most satisfactory. Many, indeed, were almost homeless before being sent to the institution, and their clothing and persons were such as to foster disease. It is now admitted that at least two of the girls in this cottage had severe "sore throat" for some days before the diphtheria made its appearance. Kittie Burkholder was taken sick on Sunday, March 29th, and her disease was also called "sore throat," but as her symptoms were somewhat alarming Doctor Ropp was summoned on Friday, April 3d, and he at once pronounced it a case of diphtheria, and ordered strict quarantine. It should be added that Kittie was employed at the general administration building, as room-girl and general assistant. She thus came into more or less contact with all the visitors at the Home.

The funerals of these girls were very private, one taking place at 4 A. M., before the inmates of the several cottages were awake. The bedding and clothing were burned and the rooms properly disinfected. No new cases have appeared since April 18th. All the sick are fully restored to health with a single exception. The quarantine continues against the entire cottage but will probably be lifted on the 15th of this month. The system of separate cottages and distinct family life which prevail at the Girls' Industrial Home, make quarantine a very simple problem. As each inmate has a separate bedroom individual quarantine can be strictly enforced. I visited cottage No. 8, and found every thing in apparent order. The cellar was dry and well kept. Windows were open in the cellar, thus giving ventilation. No decaying fruit or vegetables were to be found. From the situation of the cottage and its apparently good sanitary condition, I am inclined to attribute this outbreak of diphtheria to the introduction of the virus in the person or clothing of some of the lately arrived inmates, or of the visitors at the administration building; still, while searching for the hidden sources of such a disease and the conditions which made it somewhat virulent, the following facts should be fully considered: The privy for the cottage is situated outside of the building and a few feet to the north-east. The seats rest on sewer-pipe without traps connected six feet below the surface, with a drain to the river. The system is not a water-closet but is flushed on stated occasions, the volume and force of the water being sufficient, in the opinion of the authorities, to remove to the river all the excremental matter. At the time of the outbreak the lower drain was entirely clogged and the excreta filled the pipes to within a few inches of the seats. The girls who were taken sick roomed on the *north-east side of the building.* If the drains did not directly cause the epidemic they may have added to its severity and thus be in part chargeable with these cases of sickness and death. I desire to place on record my condemnation of the entire sewerage system of the Home. The institution is to be congratulated on the fact that the present epidemic was of such short duration and was so completely brought under control, but it may not be so fortunate in some future outbreak. Sanitarians can not have confidence in the healthfulness of the place until the present sewers are replaced by others of more perfect or more modern construction. The authorities and attending physician extended to me every facility for making my investigations and placed all the information in their possession at my disposal.

Respectfully submitted.

(Signed,) EDWARD T. NELSON, *Committee.*

INVESTIGATION OF THE WATER SUPPLY AND SEWERAGE OF ASHTABULA.

June 6th, a letter was received from Mr. A. D. Strong, member of the Board of Health of Ashtabula, in which it was stated that council had adopted a plan of sewerage for the city, with the outfall into a creek which, in dry weather, could be waded without wetting the feet. Furthermore, that this creek emptied into Lake Erie near where they obtained their water supply. He also stated that for several days their hydrants had been filled with live and dead fish.

He requested that their board of health be advised as to a proper course to pursue.

Consulting the President, Dr. Hoover, he advised me to go to Ashtabula as soon as possible, which I did on the 10th of June. Arriving at Ashtabula, I met the health officer, Dr. Hopkins, and accompanied by him and Mr. Hall, member of the board of health, and also attorney for the water-works company, made an inspection of the water-works.

The complaint of fish in the supply was well founded, as one man, by allowing a hydrant to flow all night through a gunny-bag. secured more than a peck of fish This trouble is a temporary one, however, and was easily explained on investigation.

The water supply for the city is obtained from filtering galleries constructed along the shores of Lake Erie. These galleries are dug in the sand for a depth of 10 to 12 feet, and the sides and top are stayed with strong oaken plank.

Their supply is delivered by gravity to a large brick well three or four hundred feet from the pump house. Water is pumped to a stand pipe some distance from the lake, and delivered to consumers by gravity; in case of fire the mains can be filled direct from the pumps; a reservoir near the stand pipe holds in reserve a further supply.

About one million gallons are pumped daily. It has been found that the galleries are furnishing a decreasing supply, and it has lately, on several occasions, been necessary to open one of the galleries and pump direct from the lake.

This had been done a few days prior to my visit, a trench having been dug to the lake, admitting water to one of the galleries. A wire screen was placed over the opening into the gallery; but the opening not being entirely closed, immense numbers of minnows had been washed in, so that the working of the pumps had killed many of them, and this accounted for the dead fish in the water supply. A second screen had just been put in, and no further trouble from this cause can occur.

In the afternoon, accompanied by the health officer and Mr. Humphrey, formerly chairman of the sewer committee of council, I went over

part of the proposed sewer district, and inspected the outlet into Ashtabula creek. A year ago Colonel Waring was brought to Ashtabula, and made a report on a system of sewerage for the city. He recommended the separate system, and selected the present proposed outfall. As he demanded a royalty of ten cents a foot on all sewers laid by his plan, and on various patented devices, his plans were not accepted.

Mr. Mann was recently elected city engineer, and made the plans which have been adopted. These were submitted and approved by the city engineer of Erie, N. Y.

The main sewer is 22 inches, with laterals 8 inches, except in a few places where they are 6 Ventilation is well provided for by means of numerous man-holes and lamp-holes. The gradients are sufficient to secure a good flow, and the head of each branch will be provided with an automatic flush tank. A small amount of surface water and cellar drainage will be admitted to the sewer.

The creek into which the sewage is to empty is enlarged near its outlet to the lake, forming a harbor. Its water is confined between two rows of piles, which extend into the lake about 500 feet. This creek, even in dry weather, at the outfall of the sewer contains some seven or eight feet of water, but this is slack water, dammed back by the lake; it is never stagnant, however. A half mile or more above the outfall the creek is often nearly dry in dry weather. The distance from the point of outfall to the lake is about one mile. With the water supply of Ashtabula taken entirely from filtering galleries, as was intended, the danger of emptying sewage in o the creek, as proposed, would doubtless be small; and it should be borne in mind that when Colonel Waring selected this outlet the supply of water was obtained in this way. But the filtering galleries will no longer furnish a sufficient supply, and the water-works company is now considering plans for a new supply. Under the provisions of their charter, however, they are permitted to furnish water from filtering galleries "and the shores of Lake Erie;" and if this is done, the question of the possibility of contaminating this supply with sewage, should the present plan be carried out, must be faced.

This will largely depend upon the direction of lake currents at this point. The prevailing winds are from the north-west, which will tend to carry sewage away from the water-works. I learned that the bodies of those drowned in the harbor were always carried east, often eight or ten miles; and that two children drowned in the creek were carried into the lake and east several miles. No soundings have been made to determine the direction of deep under currents, and, as is known, these may be counter to surface currents. What, if any, will be the danger to the water supply of Ashtabula, if the sewage is emptied into this creek, and what danger,

if any, if the water supply is obtained from the lake two miles from shore, as has been recommended? These are the questions I promised the board of health of Ashtabula, to bring before the State Board.

Bids for the work have been advertised; but I was informed by members of council that they would abandon the plan if condemned by the State Board of Health. After carefully surveying the ground, I could see no practical outlet for the sewer, except the one selected.

At a meeting of the local board held the night I was there, I was able to give them assistance in shaping a sanitary code, which had already been adopted by the board, and was about to be submitted to council. A committee of the board had visited Cleveland, Canton, Massillon and Warren, to aid them in preparing this code, nevertheless some serious errors and some important omissions were found. Corrections were made by the Board.

The questions of water supply and sewerage were informally discussed, and I was requested to lay the matter before you for consideration and recommendations.

REPORT ON THE SEWERAGE AND WATER SUPPLY OF THE CENTRAL INSANE ASYLUM.

To the State Board of Health:

GENTLEMEN: An article appeared in the Columbus Evening Dispatch, about the middle of May last, charging that the Insane and Imbecile Asylums were using water for drinking and domestic purposes drawn from the Scioto river; and that this supply was grossly polluted with sewage coming from the former institution.

A few days later, the undersigned, accompanied by a Dispatch reporter who was invited to go with us, visited the Insane Asylum and made an investigation of its water supply and sewerage. We found that the Insane and Imbecile Asylums are supplied with water collected by three or four filtering galleries located on the banks and in the bed of the Scioto river; and also from a large well, bricked at the upper part, located in the bed of the same river. The water is delivered by gravity to a large well near the river, and is pumped thence to the institutions named. This supply is not intended for drinking or culinary purposes, but, as will be shown later, can be and has been so used. The Insane Asylum derives its supply of drinking water, and water for culinary purposes, from a series of shallow connected, driven wells situated at the east foot of the hill upon which the asylum is located. The supply has been abundant, we were informed, until the time of our visit, when although heavy rains had recently fallen, the supply had apparently been tempora-

rily exhausted. This left the asylum without a supply of drinking water, except from the river, or from a well upon the grounds of the Institution. Water from these driven wells is not only used in the kitchen and for drinking, it is also used for the laundry, and for most purposes for which hot water is needed. The water is stored in an iron tank in a water tower; and the demand for it is so great that this tank is emptied several times daily.

Immediately above this tank is a much larger tank used for storing river water. We were informed that during the administration of Dr. Finch, the person employed to pump from the wells, was known frequently to fill the well water tank from the river water tank. The *temptation* to do this is great, for the large amount of well water used necessitates starting the pumps at 4 o'clock each morning. The *opportunity* for doing this is most favorable, for by simply turning two valves placed near together in the basement, river water, unknown to the authorities, fills the drinking water tank.

Unfortunately there are no plans of the sewerage system of the Insane Asylum to be found, so our information in regard to this is principally derived from the engineer in charge, with notes of such parts of it as were accessible.

The sewage from all parts of the building is delivered to a 20-inch iron main, which for a part of its course is carried in a brick tunnel, about five feet in diameter. The main sewer is arranged to overflow should it become clogged, and this had recently happened, the overflow being received and carried away by the brick tunnel. This tunnel, or sewer it might very properly be called, also receives surface drainage, overflow from the hot house, and possibly other waste water. It terminates north of the north wing of the building in a 10-inch sewer-pipe which passes under a road and discharges into an open ditch leading to a run which empties into the Scioto river about thirty feet above the well and filtering galleries which supply river water to the Insane and Imbecile Asylums. The main sewer is carried to the pump house on the grounds of the Imbecile Asylum, passing in its course, not far from the driven wells which furnish the drinking water. The sewage from both institutions is pumped to the Scioto river near the Harrisburg bridge, some distance below the Imbecile Asylum.

The ditch spoken of as receiving the flow from the brick tunnel or sewer was overgrown with weeds and grass, and in an exceedingly foul condition. It bore unmistakable evidence of having recently carried a large stream of sewage of an entirely different character from surface drainage and overflow from a hot house. The run into which this ditch empties also receives the drainage from the stables and slaughter house. The slaughter

house is situated several hundred yards northwest of the asylum; connected with it are a number of hog pens which were in an exceedingly filthy condition. These are raised from the ground, being built on a slope, and under them was a stinking mass of foul matter. A long trough, which receives the blood and offal from slaughtering, leads from the slaughter house to these pens. The offal and blood not eaten by the hogs enter a large vat, where they remain until the vat is filled; they are then carted away. Near the top of the vat is an overflow, from which a small stream of foul, bloody water was flowing. This stream enters the run which, as was mentioned, enters the river above the well and filtering galleries. The hogs fattened here are not eaten at the institution, we were informed, but sold, many of them, in Columbus. The slaughter house itself was far from clean. A pile of hides were curing on the floor near to the recently slaughtered beeves hanging above them.

At the entrance of the run to the river, an attempt has been made to carry the sewage it receives below the well and filtering galleries. The run is dammed at its mouth, and a tile sewer pipe runs under the dam and down the river to a point thirty or forty feet below the well and galleries. In dry weather this sewer pipe suffices to carry the run's flow; but in storms the dam, which is but two or three feet high, is overflowed, and the run discharges directly into the river. A break had occurred in this sewer pipe at the mouth of the run, a few days before we saw it, allowing an escape of sewage into the river above the galleries and well.

We were informed that for some time, dating back to February, a large amount of sewage had been coming down this run. Some time in February, the galleries failing to supply a sufficient amount of water, a hole was made in one of them, and for some time water was taken diectly from the river. No water was entering the galleries by this channel when we saw it, but the hole in the gallery was still open.

Inquiring into the health of the institution, we were informed that a number of cases of typhoid fever—about twenty—had occurred among patients and employes during the past five or six months. The cases occurred principally during the latter part of February and first of March. This was about the time the water was being pumped directly from the river through the broken filtering gallery.

One of the officers said to us that about this time he had noticed that the drinking water was discolored for a few days, and that he had spoken of the possibility of their having been supplied with river water for drinking water.

We were informed also, by one of the physicians in charge, that the institution has had cases of typhoid fever almost yearly for a number of

years. Can this be due to the convenient(?) arrangement of the valves in the basement, allowing change of water supplies?

A partial examination of the plumbing of the insane asylum was made. The water closets are mostly the hopper closets, with a seat flush; and as is so often the case with this style of closet, the valves of many of them refused to work, so that these closets were without water. The soil pipes, which are closed at their upper parts, not extending through the roof as they should, run to the basement, receiving wastes from baths, water closets and wash rooms on each floor. Water closets are not trapped under the fixture, a trap in the soil pipe in the basement being the only protection from sewer gas, while the gases arising in this unventilated soil pipe have free access to the wards, the only place for their escape. A dangerous condition of plumbing exists throughout the building.

Our attention was called to an exceedingly dangerous elevator. There are two elevators—one for freight and one for passengers—placed on either side of a corridor, the arrangement being the same on all four floors. They run from the basement to the fourth floor, and are entered by unlocking two doors, which open outward from the corridors On opening the doors there is a space about two feet wide before you enter the elevator; and when the elevator is down, a person must step out on this narrow space to pull the rope that brings it up. On the fourth floor, this narrow ledge is broken into two steps, which increases the danger of falling.

(Signed,) THOS. C. HOOVER,
C. O. PROBST,
Committee.

RECOMMENDATIONS.

In view of the conditions affecting the healthfulness of the Central Insane Asylum and the citizens of Columbus, as set forth in the foregoing report, the State Board of Health hereby recommends and urges that the following changes be made:

(1.) Sewage from the institution should not be permitted to enter the Scioto river above the wells and filtering galleries belonging to it; and the overflow from the main sewer, now received by the brick tunnel and carried by the run to the river, should be cared for in some other manner or be abandoned.

(2.) The run which enters the Scioto river just above the well and filtering galleries should be kept free from all waste and foul matters. The drainage from the slaughter house and stables should be conveyed

with other sewage to the sewage well at the Imbecile Asylum, or to the Scioto river below the source of water supply for Columbus.

(3.) The history of typhoid fever at the institution strongly suggests pollution of the drinking water, and the water tanks should be entirely disconnected, so that it will be impossible to fill the well water tank with river water.

(4) A large part, if not the entire system of plumbing is in a condition dangerous to health, and should be thoroughly overhauled and replaced by new as soon as possible.

(5.) Gates should be placed at the entrance to the elevator ways on all floors, and the elevators should be solely in the charge of a responsible person.

(6) The slaughter house should be thoroughly cleaned and purified. Hogs should not be fed on offal, and waste matters should be removed daily.

OCTOBER MEETING.

A regular meeting of the State Board of Health was held in Salem, October 28 and 29, 1891.

Present: Professor Nelson and Drs. Miller, Conklin and Scott. In the absence of the President, Prof. Nelson was invited to the Chair.

The minutes of the last meeting were read and approved.

The Secretary presented his quarterly report, which was approved and ordered filed for publication.

A report by Dr. Rardin and Mr. Cline, members of the board of health of Portsmouth, on the slaughter houses of Portsmouth, was read. The Secretary was instructed to print a circular on "The Control of the Slaughter House Nuisance," and send copies to all local boards of health.

A communication was read from Dr. Rardin, of Portsmouth, on a peculiar sickness affecting the milch cows of Portsmouth and vicinity.

The Board accepted an invitation from Mr. Hart, superintendent, to visit the public schools of Salem.

A communication was read from Dr. Virtue, of Lykens, reporting an epidemic of typhoid fever at that place, and requesting aid from the Board. The Secretary was instructed to visit Lykens as soon as possible.

The Secretary presented the following rules for reports of infectious diseases and deaths in public institutions, which were adopted:

RULES FOR REPORTS OF SICKNESS AND DEATHS IN PUBLIC STATE AND COUNTY INSTITUTIONS IN OHIO.

SECTION 1. By virtue of authority conferred upon the State Board of Health in section 2 of an act to create and establish a State Board of Health in the State of Ohio, it is hereby directed that it shall be the duty of the superintendents of all state institutions, and of all county children's homes and county infirmaries within the State of Ohio, to immediately report to the State Board of Health, upon the blanks furnished by said board, all cases of the following diseases occurring amongst the inmates or employes of their respective institutions, to-wit: Asiatic cholera, yellow fever, small-pox, chicken-pox, scarlet fever, typhoid fever, typhus fever, measles, whooping-cough, diphtheria or "membranous croup," "diphtheritic croup" or "croupous diphtheria."

SECTION 2. It shall be the duty of the superintendents named herein to report to the State Board of Health not later than the 7th day of each month the number of deaths with the causes thereof occurring among the inmates or employes of their respective institutions during the next preceding month.

SECTION 3. Any person herein named who refuses or neglects to furnish reports in accordance with the above provisions shall be subject to the penalties provided in section 8035–295 of the Revised Statutes of Ohio.

A communication was read from the Board of Health of Findlay in regard to a nuisance arising from turning sewage into the river in the heart of the city. The State Board was requested to aid the local board in abating the nuisance. The Secretary was instructed to visit Findlay.

A communication from the health officer of Lima, complaining of a nuisance from the same cause, i. e., pollution of the river by sewage, was read, and the Secretary was instructed to also visit Lima.

A petition was presented from a number of citizens of Delaware in regard to an alleged nuisance arising from the pollution of Delaware run. Prof. Nelson, who had previously been appointed to investigate the condition of the run, made a report on the subject, which was received and filed for publication. On motion, Prof. Nelson was continued as a committee on Delaware run, with authority to make such recommendations for the abatement of the alleged nuisance as he might deem advisable.

Dr. Scott made a report on the situation at Ashland with reference to typhoid fever at that place, and the recommendations of the State Board of Health for its prevention.

The Secretary presented the annual report for the year ending October 31, 1891, which was accepted for publication. The recommendations for legislation, contained in the report, were referred to the Legislative Committee for approval.

Dr. Scott presented a report of his investigation of typhoid fever at Strasburg. The report was accepted, and the Secretary was instructed to forward a copy to the public authorities of Strasburg.

The Secretary recommended that a joint meeting of the State and local boards of health be held in Columbus, in January, 1892. A motion

to this effect was carried, and the Secretary was instructed to arrange a program for the meeting.

Prof. Nelson gave notice that he would offer a resolution at the next regular meeting to change the standing committees so that they would be composed of three members, and also to establish a standing committee on legislation,

Adjourned.

On the afternoon of the 29th, the members of the Board were taken over the city, various points of sanitary interest being visited. The water-works and the source of water supply, and the outlet of the proposed sewerage system were inspected. In the evening a public meeting was held in the M. E. church, where the following program was given:

The Health Service of the State	Dr. C. O. Probst, Columbus.
One Thing Thou Lackest	Rev. R. K. Eccles, Salem.
Water and Water Supplies	Prof. E. T. Nelson, Delaware.
The Board of Health	Dr. T. T. Church, Salem.

SECRETARY'S REPORT PRESENTED AT THE OCTOBER MEETING.

Mr. President:

I have the honor to submit the following report of the work of the office since the last meeting of the Board, June 24, 1891:

The rules for the regulation of quarantine of infectious and contagious diseases, adopted by the Board at its last meeting, were printed, and a copy sent to each local board of health, to the mayor of every incorporated village without a board of health, to the superintendents of public schools, and to various newspapers, sanitary and medical journals.

Rules 1 and 2 of the rules governing the transportation of dead bodies, as amended at the last meeting, so as to prohibit the transportation of the bodies of persons dying of diphtheria, were also printed and sent to the general managers and general baggage agents of all railroads operated in Ohio, and to all local boards of health. They were also published in a number of newspapers.

The resolution of the Board adopted at its last meeting, classing membranous croup, diphtheritic croup, croupous diphtheria, and pseudo-membranous laryngitis with the diseases required to be reported to health authorities, was printed, and a copy sent to all local boards of health and to all superintendents of public schools.

A circular letter was sent to all local boards of health, inclosing

copies of the pamphlets of the Board relating to the prevention of infectious diseases, advising that on the report of an infectious disease to the board, pamphlets appropriate to that disease should be left with the family and with the immediate neighbors. A number of requests for pamphlets were received in answer to this circular, and many thousands of them distributed.

A copy of the report on the water supply and sewerage of the Central Insane Asylum, with recommendations adopted by the Board with reference to their improvement, was sent to the trustees of that institution.

Two samples of water were collected by me from the well at the Deaf and Dumb Asylum, and submitted, one to Prof. Lord and the other to Prof. Weber, for examination. Their reports, which were as follows, were both favorable as to the quality of the well water, and consequently I did not attempt to enforce an order for the closing of the well:

COLUMBUS, OHIO, *July* 20, 1891.

DR. C. O. PROBST, *Secretary State Board of Health, Columbus, Ohio:*

DEAR SIR: I have analyzed the sample of water sent me and marked Deaf and Dumb Asylum. The following are my results:

	Parts per 100,000.
Chlorine (as chlorides)	2.86
Nitrites, barely visible trace.	
Oxygen required to destroy organic matter	0.07
Free ammonia	0.0030
Albuminoid ammonia	0.0046

These results show that the water is very free from organic "impurity," and there is no chemical indication that it is other than "fit for drinking and culinary purposes."

I would respectfully refer to Dr. Howard's report upon the well waters of the city (Annual Report Columbus Water-works, 1885) for figures with which to compare my analysis. Of course a well is always open to suspicion, and the analysis only refers to the sample of water sent me—future contamination of the well must be guarded against; further, I would add the caution that chemical analysis only shows the presence or absence of "putrescent organic matter," and hence infers the presence or absence of disease germs, but as this conclusion is not invariably correct, though extremely probable, I would never rest exclusively upon an analysis in passing judgment on a water; especially should surrounding circumstances tend to indicate that the purity of a given sample was accidental and not the rule.

Pardon the liberty I take in thus exceeding the limits of my instructions in this report, for as far as my analysis goes the water is certainly pure organically.

Very respectfully,

(Signed,) N. W. LORD.

Sample of water received of State Board of Health, marked "Water from Deaf and Dumb Asylum, collected July 17, 1891, 4.30 P. M."

	In 1,000,000 parts of water.
Organic matter	16.80
Chlorine	30.00

So far as chemical analysis is concerned, there is nothing wrong with this water.

(Signed,) H. A. WEBER.

I might say in this connection, that a child of the steward living at the institution was taken with diphtheria some six or eight weeks ago. The family temporarily removed from the building, and the child subsequently died.

The plumbing in the steward's room was found to be in an exceedingly bad condition. The asylum officials made immediate application for permission to create a deficiency of $1,600 for plumbing in addition to the $1,000 given them by the last General Assembly.

October 16th, I learned that several cases of typhoid fever had occurred at the Institution for the Deaf and Dumb.

October 23d, in answer to an inquiry by telephone, the Superintendent reported six cases. Dr. Hoover and I visited the institution October 26th, and met the Superintendent and Dr. Wirth, of Columbus, the attending physician. We were shown five of the patients, who were abed, the other two cases, one of which was probably not typhoid fever, being reported well. The patients were all received at the institution September 9th. The date of first illness in each case could not be positively fixed, but from the dates of the first prescriptions given by the attending physician, it was as follows:

Emma Genzer, home 51 Burton street, Cleveland; taken sick September 16, seven days after arrival. Minnie Roush, home near Eno; taken sick September 27, eighteen days after arrival. Annie Corey, home 54 Walnut street, Cleveland; taken sick September 28, nineteen days after arrival. Mary Nalor, home near Barnesville; taken sick October 5, twenty-six days after arrival. Gustave Ehlert, home 31 Burton street, Cleveland; taken sick October 9, thirty days after arrival. Lilian Strock, home near Troy; taken sick October 16, thirty-seven days after arrival. It was claimed by the Superintendent that the disease in all instances had been contracted before the patients came to the Institution, but the last two cases would certainly be examples of most remarkably prolonged periods of incubation of typhoid fever.

The only change noted in the sanitary condition of the institution since the former investigation by the Board, was in the plumbing. This was completely overhauled during the past summer; all fixtures were removed, cleaned and properly trapped, and most of the water closets and urinals were replaced by new ones. This work was all completed four or five days before the children were received.

There was no apparent connection between the cases in the institution, as they were said to be occupying different dormitories. The water in use is from the well previously described.

The stools of the patients were being disinfected(?) by carbolic acid. The acid was being used by the nurse without measurement, so we can

not be sure that the stools were in fact disinfected. So in regard to the clothing of the patients. This was being placed in a bath tub, and carbolic acid poured into the water until it "smelled strong."

In addition, the matron—I think it was—said that boiling water from the faucet of the tub was poured over the clothes, and that they were afterwards spread on the grass before being sent to the general wash.

Prof. Howard made a chemical analysis of the water from the well at the deaf and dumb asylum, October 27, with the following results:

PARTS IN 100.000.

Oxygen required	0.105
Free ammonia	0.005
Albuminoid ammonia	0.006
Chlorine	3.000

Further inquiries were made in regard to the shipment of a corpse from Cincinnati to Felicity, the alleged cause of death having been diphtheria. The health officer of Cincinnati stated that he had summoned Dr. Flannagan, the attending physician in the case, to appear before him, and that he had positively affirmed that the child died of pneumonia. The matter was then dropped.

REPORT ON THE LOCATION OF A CEMETERY AT NAVARRE.

A communication was received from Dr. Conklin stating that he had been requested to visit Navarre, a small village near Canton, on account of the proposed location of a cemetery at a point where it was feared it would pollute the water in many wells. Dr. Conklin requested me to go with him to Navarre, which I did. An investigation was made of the proposed site for the new cemetery and its relation to the village, and especially to the water in use. The following is a copy of the report made to the trustees of the cemetery:

To the Trustees of St. Clement's Cemetery Association, Navarre, Ohio:

GENTLEMEN: Having been called upon to determine the probable effect upon the public health of the proposed new cemetery for your village, we would respectfully report as follows:

Navarre is built upon a drift formation of great depth. The water supply is obtained from wells at a depth of 25 to 65 feet, the former depth being met with where the surface slopes towards the Tuscarawas river. The water is found in sand and gravel with no impervious cover over it, so that the rainfall and all impurities carried down with it sink readily to the source of water supply. A large sheet of water underlies the whole village, and owing to the loose character of the soil, has possibly worn channels for itself in its passage to the river. A canal runs between the village and the river, the village being built to the banks of the former, and all along this canal springs break out, some of them of great magnitude.

The flow of the ground water is from the proposed site of the cemetery, under the

east portion of the village, to the river, the canal, however, intercepting this flow below the locks. Any impurities that may be carried from the cemetery to the underlying water table will possibly reach the wells in that part of the village. The danger of polluting the water supply, if the foregoing premises are correct, will depend upon the possibility of 50 feet or more of sand and gravel to filter out all impurities, including disease germs, from the water which passes through the cemetery. The experiments of Mr. Ralph Pumpelly to determine the ability of sand to remove bacteria from water passing through it are summed up as follows: "From these results it appears very clearly that sand interposes absolutely no barrier between wells and the bacterial infection from cesspools, cemeteries, etc., lying even at great distances." (See Annual Report of Nation Board of Health, 1882.)

The germs of typhoid fever have been carried under the base of a large mountain, polluting a spring on the opposite side, and giving rise to an epidemic of that disease.

Taking these facts into consideration, we are of the opinion that the health of your village will be endangered by locating a cemetery at the site proposed. We have not lost sight of the fact in reaching this conclusion, that three cemeteries are already located near to the one under consideration, nor that, so far as can be determined, these have not affected the public health. No one can say that, under favorable conditions these may not yet do so, and we would earnestly recommend and urge that these cemeteries be abandoned and the bodies removed to a more favorable location.

The peculiar soil formation at Navarre, and the remarkable sheet of water under it, make it of the utmost importance to prevent soil pollution; and the best interests of your village demand that all burials north of it should be prohibited.

(Signed,) S. A. CONKLIN, M. D.,
Member State Board of Health.
C. O. PROBST, M. D.,
Secretary State Board of Health.

REPORT ON A CEMETERY AT BERLIN.

Dr. Wise requested me to come to Millersburg and go with him to Berlin, a small village near Millersburg, where there was some trouble in regard to the extension of a cemetery.

The following notice to the township trustees will explain the conditions found there, and the action taken with reference to the same:

GENTLEMEN: Having examined the cemetery at Berlin, Ohio, on the 25th of September, we find that the conditions there are dangerous to the public health, to-wit: The interment of bodies east of the burial grounds originally provided by the township trustees, such interment being in dangerous proximity to wells to the north, one of which furnishes water to the school children of Berlin.

As interments now being made are on private property, not set apart for burial purposes by the proper authorities (the township trustees), you are hereby notified to prohibit further burials north or east of the cemetery as it stands at the present time.

Additional burying grounds will be required at once, and we respectfully advise that a new cemetery be provided, and at a much greater distance from the village than the present one.

We would also advise that water for the school children be taken from a well at a greater distance from the cemetery than the one now in use for that purpose.

(Signed,) S. P. WISE, M. D.,
Member State Board of Health.
C. O. PROBST, M. D.,
Secretary.

A telegram was received from Prof. Nelson requesting me, in the name of the council and board of health of Sidney, to come to Sidney and aid in securing the introduction of a system of sewerage which was proposed for that city.

A day was spent by Prof. Nelson and myself in going over the plans and route of the proposed sewer, and the following report was submitted to the board of health of Sidney:

REPORT OF AN INVESTIGATION OF A PROPOSED SYSTEM OF SEWERAGE FOR SIDNEY, OHIO.

August 1, accompanied by Mr. Pampel, city engineer, Mr. Marshall, chairman of the sewer committee, Dr. LeFevre, health officer, and other citizens of Sidney, we surveyed the route of the proposed sewer from beginning to end. The greater portion of the city was also gone over to determine the possibilities of the proposed sewer to afford an outlet for the sewage of the entire city, and for the territory that will likely be occupied in future years.

The plans for the proposed sewer, giving route, grade, size and cost, have been fully detailed in an excellent report by your city engineer, who evidently has given the matter careful attention, and who shows himself thoroughly familiar with sanitary drainage. Before commenting on his report it may be well, in view of the fact that the question of sewerage is new to many of your people, to set forth briefly the necessities for providing sewerage for your city.

Life is constantly attended with death, and millions upon millions of tons of dead organic matter are added yearly to the soil, where; by the aid of the myriads of microscopical germs found in its upper layers, it is broken up into innoxious substances suitable for plant life. Isolated families with large grounds at their disposal can thus, by nature's aid, readily and with profit dispose of the waste and foul matters which pertain to all households.

But there is a limit to the work of these little scavengers, and in cities, with the small area of ground per capita, such matters can no longer be disposed of in this manner. Then, usually, comes soil pollution, which sooner or later produces sickness. Of all the forms of soil pollution, that by human excrement is the most common and most dangerous. The average man is content to deposit such matter in pits in the ground, trusting, if he thinks of it at all, that somehow it will be taken care of. Now, these beneficent little servants of man (the germs that cause decomposition and nitrification of dead organic matter) can not live without air, and comparatively few of them are found below three or four feet from the surface. Consequently, the material thrown into privy

it s is but partially returned to the soil, while offensive and poisonous gases and compounds are formed which pollute the soil over wide territories. If this soil is loose and porous, as is markedly the case at Sidney, these poisonous substances are carried into the ground water and into wells, even a hundred feet distant.

Excreta of persons suffering with infectious diseases usually contain the germs which are the cause of the disease, and these germs thrown into privy pits may be carried long distances in a loose soil, and by entering wells, or by being drawn with the ground air into houses, may cause outbreaks of these diseases.

The great majority of the people of Sidney depend upon wells for a water supply, and use uncemented pits for receiving excreta. Each year the danger from such conditions will increase, and sickness, preventable by proper sewerage, will result.

The pollution of your soil occasioned by your public water-works is also a matter for serious consideration. In addition to the filth collected and carried down into the soil by rain fall, and to that leaching into it from hundreds of privy pits and cess-pools, your water-works are supplying the city with 250,000 gallons of water daily, or over 91,000,000 gallons annually, nearly all of which, more or less fouled by usage, soaks into the ground, bearing its load of filthy matter along. For this reason it is always advisable that water-works and sewerage should go hand in hand. The location of Sidney is such, being in a basin surrounded by hills, with the character of the soil—sand and gravel—that the greatest care should be taken to prevent soil pollution; and although favored by nature with a site and soil that should make your city one of the healthiest spots in the State, this may nevertheless become so impregnated with impurities as to become highly prejudicial to health. All recognize the necessity for pure air and pure water, but it should be impressed that these can only be found where the soil is kept pure. Pollution of soil always means pollution of air and water.

There are several ways to prevent soil pollution. Excrement may be received in tight receptacles and removed weekly or semi-weekly—the "pail system;" or dry earth or ashes may be used to prevent nuisance, and the excrement removed less often—the "dry system." Privy pits and cess-pools may be made to receive waste matters, and if these are perfectly water tight the soil will be protetced. By either of these plans a considerable amount of foul water, such as dish water, laundry water, etc., is left uncared for; and where the conditions are favorable the removal of waste matters by sewers—the "water carriage system"—is by far the most satisfactory; and in few places can a system of sewerage be constructed at

less cost or used with greater advantage than in Sidney. The surface drainage is such that all or nearly all storm water is quickly removed without detriment, so that it will be necessary to construct sewers for sewage only—the so called "separate system" of sewerage. This is much cheaper than the "combined system," which cares also for storm water, and is at the same time much better from a sanitary point of view. Again, no deep cuts will be needed to obtain a proper grade, and the excavations can be easily and cheaply made.

It is difficult in our country, where vital statistics are so inaccurately kept, to offer conclusive evidence of the effect upon the public health of sewerage works. That they are the means of reducing the death rate is the universal testimony. In England, where vital statistics are very accurately kept, the influence of sewerage upon health has been carefully studied. In "Sanitary Engineering," by Latham, a table is given showing the improvement in public health following sanitary work (principally sewerage) in twelve English towns with populations ranging from 7,000 to 68,000. The saving of life varied from $2\frac{1}{2}$ to 32 per cent., while the reduction of the typhoid fever rate varied from 10 to 63 per cent., with an average of $47\frac{2}{3}$ per cent.

The plan proposed by your city engineer is open to few objections. The size of the main sewer, 20 inches, is ample, possibly more than ample for what will be required of it. The city of Memphis, Tenn., which is very completely sewered, discharges all of its sewage through two 20-inch mains, and these are seldom or never more than half full. It might be desirable to commence your main sewer with a less size—say 16 inches, and increase it to 18 or 20 inches towards the lower end, This seems advisable from the fact that it is designed to receive a certain amount of storm water near its terminus, otherwise a 12 or 15-inch sewer would be ample. The admission of a small amount of storm water should not be omitted, as Col. Waring, who introduced the "separate system," claims a royalty where this system is exclusively used.

The engineer's report, as published in the Sidney Journal, July 31, makes no mention of the ventilation of the sewer; I understand, however, that this will be provided for by man-holes and lamp-holes. These should be placed, with perforated covers, at sufficiently frequent intervals to allow free ingress and egress of air. It is a good plan to place man-holes at the junction of lateral sewers, so that their openings will be easy of inspection. Arrangements should also be made for the periodical flushing of the sewer. It has been proposed to accomplish this by opening a gate and getting a head of water from the canal. This would answer well for the main sewer, and when laterals are laid an automatic flush tank should be placed at the head of each.

The proposition to empty the sewage into the river above the dam should not be entertained as it would almost certainly create a nuisance. The city of Columbus a few years ago had an experience of this kind, and escaped paying damages only by destroying the dam.

A question that will have to be met, should the sewer be built, is the dangers arising from badly constructed house connections. If your sewers are broken into without control, and if house drains are laid with leaky joints, as is often the case unless guarded, there will be such an escape of sewage that there will be almost as much soil pollution as if the privy pits are maintained. Tapping the sewer should not be allowed without a proper permit, and when house drains are laid they should be tested for leakage by a competent person before they are covered.

Sidney would certainly be benefited by the introduction of a system of sewerage, and with her natural advantages the cost will be considerably less than many cities have to pay for such works. It will undoubtedly lower her death rate, will be the means of preventing much sickness, and will prove to be a convenience which, once used, would not be abandoned for many times the cost.

(Signed,) C. O. PROBST, M. D.,
Secretary State Board of Health.
E. T. NELSON,
Member Ohio State Board of Health.

REPORT ON SCARLET FEVER AT CALEDONIA.

A telegram was received September 20th from the health officer of Caledonia, requesting me to come there immediately. A second telegram, in answer to one from me inquiring the occasion of a visit, was received saying: "Scarlet fever epidemic; necessary for you to come." I went on the 22d.

I learned that scarlet fever had prevailed there for some time, there having been about twenty-two cases with no deaths from the disease. The board of health had the matter well in hand. Physicians were reporting cases, quarantine was being enforced as far as possible, and the pamphlets of the State Board relating to the restriction of the disease had been well distributed. The board were in doubt as to their authority in some cases that had come up, especially as to the closing of the public schools. The board of education had closed the schools ten days prior to my visit, and the board of health desired advice in regard to keeping them closed.

A meeting of the board was held at night, and a number of questions were brought up for discussion. The board had never adopted rules and

regulations, and the ordinance establishing the board did not authorize it to do so. The board had enforced certain rules, placarding houses, for instance, for which they had no authority.

At my suggestion, the mayor, who was present, agreed to call a meeting of council on the following night for the purpose of amending the ordinance establishing the board of health by giving the board authority to make and enforce its rules and orders, and fixing a penalty for their violation. The rules and regulations recommended by the State Board were given to the board for adoption. As the board was informed of the location of each case of scarlet fever in town, and as all new cases were required to be promptly reported, I advised that the schools should be opened on the following Monday. The superintendent of schools was to be notified at once of all new cases reported to the board.

The health officer reports on the 22d of October that there had been but three new cases of scarlet fever since my visit, and no deaths.

REPORT ON THE ABATEMENT OF A NUISANCE AT WILMINGTON.

A communication was received from Dr. Austin, health officer of Wilmington, stating that they were having trouble with a nuisance arising from hog pens just outside the corporation line, and requesting me to come and advise their board of health as to a method for abating it. As I was called to Washington C. H. on the same day, and to Middletown on the following day, I arranged to stop at Wilmington between trains, going to Middletown via Cincinnati.

The board of health of Wilmington, acting on my advice given on a former visit, had adopted a rule prohibiting the keeping of hogs within the corporation. Two colored men secured lots just across the street from the corporation line, a number of dwelling houses within the corporation being built along the line, and were keeping there about twenty-five hogs, feeding them principally with swill collected in Wilmington. Odors from the pen were annoying a number of people, and the board of health was at a loss what course to pursue.

Dr. Austin, health officer, and Dr. Irwin, a member of the board of health, met me at the train and drove with me to the hog pens, where I met the owners. I informed them that they were violating a statute against nuisances and that if the hogs were not removed it would be the duty of the board of health to prosecute them.

They finally agreed to remove their hogs further from the corporation, which I have since learned was done.

REPORT ON THE ALLEGED POLLUTION OF THE WATER SUPPLY OF WASHINGTON COURT HOUSE.

The board of health of Washington C. H. telegraphed me that there was great danger of their public water supply being polluted from certain conditions then existing, which they desired me to come and investigate at once.

I went the following day, and was met at the train by Mr. Edwards, health officer; and in company with Drs. Hare, Ireland and Dennis, and the mayor and Mr. Maynard, superintendent of the water-works, visited the water-works. I was informed that my opinion was specially desired as to the liability of the water supply being polluted by conditions of a temporary character, the question as to the purity of the supply at other times not being under consideration, as the company within the next few days would endeavor to find a supply of artesian water to take place of that in use.

I made a verbal report, which, at the request of the board of health, I afterwards put in writing as follows:

To the Board of Health, Washington C. H., Ohio:

GENTLEMEN: Having, at your request, examined the condition of the public water supply of your city, I beg to report as follows: It should be stated that my investigation was limited to determining whether the public water supply was, at the time, being contaminated so as to possibly affect the health of those using it for drinking or culinary purposes.

The public water supply of Washington C. H. is being obtained from a large well a short distance north of the city and about one hundred feet from a small creek. This creek is dammed a few hundred yards from the well, and in dry weather the creek bed below the dam is perfectly dry. Above the dam the water collects in stagnant pools, which were found covered with a thick, green scum; a few dead fish and turtles were found in this water.

With a view of increasing the supply of the well, which had been insufficient for a time, a trench was opened a few days before my visit and the water in the pools above the dam brought into the old creek bed, about one hundred feet at the nearest point from the well.

The well is about twenty-nine feet deep, measured from the surface of the ground, and is dug, after removing the top soil, through a stratum of gravel eight or ten feet thick, then through blue clay nine to ten feet, beneath which in sand and gravel the supply is found. There were about nine feet of water in the well when I saw it; the pumps were not running. As it is possible that the well draws, to some extent, from the water turned into the old creek bed, this water being entirely unfit for use, and as there is great doubt whether it would be sufficiently purified in passing through one hundred feet of loose sand and gravel, I would advise that the trench bringing water from above the dam be permanently closed, and that the creek below the dam be emptied of the water turned into it.

Very respectfully,

(Signed,) C. O. PROBST, *Secretary.*

This action was at once taken by the water-works company.

REPORT OF AN INVESTIGATION OF AN ALLEGED NUISANCE AT MIDDLETOWN, OHIO.

A petition from Middletown was received, with twenty-six signatures, stating that a sewer on Second street was a source of great nuisance to people living along its course; that foul odors were constantly given off from it, and that cases of fever, scarlet and typhoid, and also diphtheria had recently occurred among residents of Second street; that the matter had been brought to the attention of the board of health and also of council, but that no relief had been granted them.

The State Board was urged to personally investigate as soon as possible.

Dr. Hoover and I accordingly visited Middletown September 30th. We called on Dr. Lummis, health officer, who went with us over the route of the Second street sewer, and we also visited the mayor, city solicitor and the members of council, from whom the following was learned:

About twenty years ago a large stone sewer, six feet in diameter, was built from the edge of the town, down Second street to the river. This was intended to carry the waters of a small creek that flowed through the village, and inlets were also provided to carry off storm water from Second street.

Some time afterwards council granted a tobacco factory and a card factory the right to empty pure water into this sewer. As a matter of fact, for many years these factories have been turning foul wastes into this sewer; and as there has recently been no water in the creek in dry weather to flush the sewer, and as street inlets are untrapped, these wastes have given rise to foul odors which have annoyed the people living along the sewer. There were no houses connected with this sewer except the factories already mentioned. The health officer denied the report that there was or had been an excessive amount of sickness along the sewer.

There were but two cases of scarlet fever on the street at that time, and there had recently been one case of typhoid fever, which, however, was brought there from Cincinnati.

During the serious epidemic of diphtheria in Middletown, three years ago, there was no special prevalence of the disease along the line of this sewer.

Preparations have been made to remedy the conditions in the following manner:

A drain made by taking a half section of a 30-inch sewer will be laid in the bottom of the 6-foot sewer. The lower half of the large sewer will be cemented and made smooth to prevent the lodgment of foul

matter. All street openings into the large sewer will be temporarily fitted with hinged doors to prevent foul odors escaping into the street.

We objected to this part of the plan, but were informed that it was being done on account of the demand for immediate action, and that catch basins with water seals would be subsequently put in.

Mr. Sorg, who owns the tobacco factory which drains into the sewer, has proposed to build a sewer at his expense, which is to be used as a public sewer, and is to be purchased by the city at the end of five years. An ordinance to that effect has passed council.

A line of small pipe sewer built under the direction of Mr. Boeh, of Cincinnati, was recently completed, which, with the line to be built by Mr. Sorg, will afford sewerage for a considerable portion of the city.

We were satisfied that every thing reasonable was being done by the council and board of health to relieve the conditions complained of by our petitioners.

REPORT OF AN INVESTIGATION OF AN ALLEGED NUISANCE ARISING FROM SLAUGHTER HOUSES NEAR MARION.

A lengthy petition was received from Marion in regard to an alleged nuisance arising from a slaughter house just outside of the corporate limits. On the following day a communication was received from the board of health of Marion, requesting me to meet the board and advise them as to the abatement of the same nuisance. I went there July 20, and with the mayor, health officer, and two members of the board of health, visited the slaughter houses in question.

I found four slaughter houses located not far beyond the corporation line, and but a short distance from a half dozen or more dwelling houses situated within the corporation. The people living in these houses were the ones who were urging the board of health to abate the nuisance.

The three slaughter houses farthest removed from the dwelling houses were in average condition, i. e., not overly clean, but the one nearest to the dwellings was in an exceedingly filthy condition, and principally responsible for the nuisance complained of. The yard connected with this slaughter house was covered to the depth of a foot or more with stinking mire. A crib, probably ten by twelve feet and seven feet high, was filled with uncleand bones, and heads containing brains, which had been accumulating for many months. These were in different stages of decomposition, and gave out a most horribly bad odor. The slaughter house itself was almost as filthy as its surroundings. Beeves killed here during the day were hung in the house over night in an atmosphere that must have been exceedingly foul. At all of these places hogs were being

fattened on the offal, and were as filthy as hogs can be. (I may say in parenthesis, that I have not been able to eat fresh pork since inspecting these slaughter houses.)

A meeting of the local board of health was held in the afternoon, and the question of abating the nuisance discussed. The board informed me that they had visited these slaughter houses time and again, and had urged the owners to keep them clean. Three of the places had since been kept in a tolerably clean condition, but they could do nothing with the owner of the one above described. Being outside of the corporation, the order of the board of health did not affect him, so he was arrested under the general statute against nuisances. He was bound over to court; and as his case would not be tried for several months, the nuisance seemed likely to be continued until cold weather. I suggested that the case might be reached in the following manner, which would at the same time greatly benefit all the people of Marion: Let the board adopt a rule requiring all persons retailing meat and milk in the city of Marion to first secure a permit from the board of health, this permit to be issued semi-annually. A meat and milk inspector was to be appointed by the board of health, who would be required to inspect the slaughter houses and dairies, the retail shops, and the meat wagons and milk wagons of all persons retailing meat or milk in Marion, and report their condition to the board of health. If any of these were found in a filthy or unsanitary condition, which would be liable to affect the wholesomeness of meat or milk, a permit to retail the same in the city of Marion would not be granted by the board until such slaughter house, dairy, wagon, etc., had been placed in a condition satisfactory to the board of health. All persons retailing meat or milk would be required to conspicuously display in their shops and on their wagons, the permit issued by the board of health. A fee of fifty cents might be charged for issuing this permit. I also recommended the board to adopt a rule prohibiting the sale of hogs which have been fattened on the offal of slaughter houses. The board appointed a committee to draft rules in accord with these suggestions, and submit them at the next meeting of the board.

The health officer subsequently reported that the owners of the slaughter houses had taken alarm, and that all of them had been thoroughly cleaned and placed in good condition. The man who was arrested agreed to pay the costs and his case was dismissed.

REPORT OF AN INVESTIGATION OF TYPHOID FEVER AT ASHLAND, OHIO, MADE OCTOBER 6, 1891.

A letter was received from Dr. Hunter of Ashland, reporting that typhoid fever was epidemic there; that the sanitary condition of the city was very bad, and, in his opinion, largely accountable for the prevalence of the disease. He stated that there was no board of health in Ashland, or at least that nothing was being done by the board. He requested the State Board to investigate.

On the following day I received a letter from Dr. Scott, inclosing a letter from Dr. Hunter in regard to the same matter. Dr. Scott and I met in Ashland on the 6th of October, and made an investigation of the sanitary condition of the city, with special reference to the prevalence of typhoid fever. We learned that the epidemic had commenced about July 1, the first case occurring in the Sheets family, living on Second street. The sanitary condition of the house and surroundings of this family at that time, as described by the attending physician, was exceedingly bad. A privy without a vault, located near the house, allowed fecal matter to drain unseen among weeds on an adjoining lot. House slops of all kinds were also thrown there, and a very foul nuisance was thus created. This was abated some time after the first case occurred in this family, but three other members of the family subsequently were attacked. This family obtained drinking water from the court-house well, some distance away. Other cases speedily followed, without apparent connection with the cases in the Sheets family, until, up to the time of our visit, there had been in the neighborhood of 150 cases in a population of 3,600. It was impossible to learn the exact number of cases, as no record of them was kept by the board of health. There were but four deaths reported from the disease, a very low death rate. Many cases of fever occurred which the physicians were not willing to pronounce typhoid, cases running their course in four or five days or a week; these cases seemingly responded to the action of quinine. Other cases presented all the well marked symptoms of typhoid fever, and there could be no doubt of their character.

We interviewed most of the physicians, some of the members of council, and other prominent citizens, and, after returning home, made the following report to the council of Ashland:

To the Council, Ashland, Ohio:

GENTLEMEN: Having made an investigation of your city with reference to the probable cause or causes of the prevalence of typhoid fever prevailing there, and also as to the present and future sanitary needs of your city, we have the honor to transmit to you, as representatives of the citizens of Ashland, the following report:

We find many grave defects in the sanitary condition of your city, which are liable to foster and encourage the spread of, if not to produce, epidemic diseases.

Ashland, for many years, has been remarkably free from diseases of this character, but it is probable that she is now reaping the results of a total disregard of some of the most essential sanitary laws.

To particularize—we would call your attention to the condition of your sewers, following their misuse, and to the connection they seem to bear to your present trouble.

There are two sewers in Ashland, one running in Second street from above the court house to its outfall in the run, a distance of probably 2,000 feet, and the other in Center street, nearly of equal length, and discharging into the same run higher up under the Center street bridge near the center of the city. It is to the Second street sewer that we would specially refer. This sewer, built some eight or nine years ago, is constructed of brick, is egg shaped, and probably 24 by 36 inches in size. Originally intended for storm water only, it has for several years, by ordinance of council, received the drainage from privy vaults and water closets belonging to dwellings and store houses along Second street. It also receives the laundry and other fouled water from some of these houses, and water from their roofs. Untrapped catch-basins admit storm water from the street. The lower end of the sewer is closed with a wooden door hung on hinges. Some of the privies and water closets connected with the sewer are inside of houses, and many of these are without traps or are inefficiently trapped. The cellars of some houses are also conneccted with this sewer, so that many people are exposed to the gases which escape from it.

This would be no unusual, though still an alarming, condition if the city had water-works; but as the entire water supply is from wells, storms must be depended upon to flush the sewer. A long, but not unusually prolonged dry spell has prevailed for many weeks, and the flow in the sewer, seen at its outfall, was the merest thread, which an inch pipe would have carried; the sewer was practically one long cess-pool. The creek which receives the discharge from this sewer is a small stream containing but little water in dry weather. The sewage has polluted this creek to such an extent as to create a nuisance, and is the cause of much complaint from citizens living in that part of the city. Foul odors escape from the sewer at street openings, which are at the sidewalk, and are drawn into cellars and houses. These odors, which are due to the gases formed by the decomposition of excremental and other filth discharged into the sewer, are of themselves, in concentrated form, capable of producing sickness; and if the bowel discharges of even one typhoid fever patient were thrown into the sewer, as was doubtless the case, there would be great liability of the germs of the disease being carried by air currents from the almost dry sewer into the streets and into the houses connected with the sewer; especially would this be true where no trap—as is the case in some houses—exists between the house and the sewer. Some thirty-five or forty cases of fever, we are informed, occurred along the line of this sewer, and some of the worst cases in houses without traps connected with it. It is very probable that the condition of this sewer has been one of the chief causes of the spread of typhoid fever.

A sewer in a town without water-works, depending alone on storm water for flushing, should not receive human excrement or other filthy matter, as the amount of water entering the sewer, except during storms, will not suffice to carry such matters away and keep the sewer clean. We therefore recommend that, until arrangements have been made for frequent and thorough flushing of the sewer, all filth from privies, water-closets, etc., be kept out of them. This rule should also apply to the Center street sewer. It may be noted here that there were no cases of fever reported along the route of the Center street sewer, although several—five it was stated—privies or water-closets empty into it. It is very probable, however, should a case of typhoid fever occur in one of these houses, and the stools of the patient be emptied into the sewer without disinfection, that other cases would occur in houses connected with it. By keeping the contents of privies, etc., out of the sewers you will also greatly relieve, if not entirely abate, the nuisance caused by emptying the sewage into the creek.

We are informed that privy vaults in Ashland are uncemented—not water tight. In some parts of your city the soil formation is such that the contents of privy vaults must leach through the ground to great distances, polluting the water in adjoining wells. The stools of a typhoid fever patient thrown into a privy dug in such soil would greatly endanger all wells within a circle of a hundred feet or more. This, indeed, is the most common cause of the spread of typhoid fever; and a careful inspection of all wells in your city should be made, and all that are obviously polluted by drainage from privy vaults should be closed, and temporarily—perhaps permanently—abandoned.

There will probably be great difficulty in your finding a suitable supply of water available for public use, and possibly your city may never establish water-works. The future health and prosperity of Ashland, therefore, will depend largely upon the protection given to wells, and rigid rules should be enforced to prevent their pollution. All privy vaults and cess-pools should be water-tight, and where these are not used dry earth closets should be substituted. By these means, and by the proper disposition of garbage, manure and other filth, the purity of your wells may be secured and maintained.

The members of council constitute your Board of Health. This must necessarily increase the work of council and cause some of their duties to be neglected. It would be much better for the sanitary interests of your city to have a board of health separate and apart from council, with health matters alone to look after. as was the intention of the law establishing boards of health. We would suggest that two members of this board should be physicians, as their training especially fits them to deal with health questions. A well chosen board of health, endowed with ample power, will undoubtedly be of great benefit to your people.

The board, which should be appointed at once, should employ a competent man to inspect the sanitary conditions of all houses and premises within the corporation, and all conditions liable to affect health, and capable of being remedied, should receive prompt attention.

The work of putting your city in good sanitary condition will not be that of a day, but of many months; and it will require constant and intelligent oversight to prevent the occurrence of the lamentable experience you are now having.

We have indicated the direction of the work most urgently demanded, and may possibly be able, from time to time, to assist in providing for the sanitary welfare of your citizens.

C. O. Probst, M. D.,
Secretary State Board of Health.
A. J. Scott, M. D,
Member of State Board of Health.

The board of health at Waverly, some time ago, was abolished because it attempted some aggressive measures. This caused the council to pass an ordinance to abolish the board. Dr. Hutt, formerly health officer, recently brought suit to compel council to establish a board of health. The suit was decided in his favor, and a peremptory writ of mandamus was issued by the common pleas court at Waverly, commanding council to at once establish a board of health. Council was also ordered to pay Dr. Hutt his costs in the case.

I secured a copy of the proceedings, had the essential part of them printed, and sent a copy to each village in the state of over 500 inhabitants that had failed to establish a board of health. The result was a considerable gain in the number of local boards of health. At the close

of our last fiscal year, 285 local boards were enrolled. At this time, October 23, there are 357, a gain of seventy-two. There are still 90 villages of over 500 inhabitants, according to the report of the Secretary of State on the national census, that have failed to establish boards of health.

In accordance with instructions at the last meeting, I have arranged for the collection of samples of Ohio river water at the following places: East Liverpool, Wellsville, Steubenville, Martin's Ferry, Bellaire, Ironton, Portsmouth and Cincinnati. These are the only places in Ohio that are obtaining public water supplies from the Ohio river at the present time. Toronto has completed water-works excepting its pumps, which have possibly been put in place by this time. Bridgeport has laid pipes for water, which it will obtain from the Martin's Ferry water-works, and has nearly completed its reservoir. The Bridgeport authorities are having some trouble in enforcing a contract for water entered into by a former council of Martin's Ferry, and it may be some time before they will obtain water from the Ohio river.

Samples are collected at all places, except at Cincinnati, on Monday afternoon of each week, and are delivered in Columbus Tuesday at 5:30 A. M. Prof. Howard has been engaged to do the chemical work, and Dr. Bleile, of the O. S. University, will make the biological examinations. New glass stoppered bottles, which were treated with strong sulphuric acid and then thoroughly washed with distilled water, are being used for collecting samples. The following directions for collecting and shipping samples were given to each collector:

Directions for the Collection of Samples of Water for Chemical Analysis.

If the sample is to be taken from a hydrant, allow the water to run several minutes before making the collection. Then unstopper the bottle and thoroughly rinse it three times with the water to be collected. After rinsing, fill the bottle completely full, not allowing the water which enters the bottle to come in contact with the hands. Pour out a small quantity so as to leave about an inch of air space under the stopper. Quickly stopper, and fasten in the stopper with strong twine, first covering the stopper and neck of the bottle with a clean piece of cotton cloth. Gum to the bottle one of the labels sent you, properly filled out, and numbered 1, 2, 3, etc., in the order in which they are collected. Do not touch the stem of the stopper, or the inside of the neck of the bottle.

If the sample is collected directly from the river, rinse the bottle thoroughly with the water to be collected, and then plunge the stoppered bottle under the water to a depth of one to two feet; remove the stopper from the bottle under water and allow it to fill; stopper and label as described above.

Directions for the Collection of Samples of Water for Biological Examination.

For this purpose use the *small* bottle. On the day on which the sample is to be collected, prepare the bottle for use as follows: Place the bottle and stopper, with the

stopper removed, in a *hot* oven of an ordinary stove. Allow them to remain in the oven for one hour, and while still hot, and without touching the stopper with the fingers, tightly stopper the bottle. Tie tightly over the stopper and neck of the bottle a square of rubber cut from the rubber band sent you for the purpose. (This rubber has been sterilized.)

In collecting the sample from a hydrant, first allow the water to run several minutes, and then quickly remove the rubber and stopper together, not touching the stopper, or at least the ground portion of it, directly with the fingers; grasp the bottle near the lower end, fill it, and then stopper and cover with the rubber with as little delay as possible.

If the sample is to be taken directly from the river, plunge the bott'e one to two feet below the surface; remove the rubber and stopper under water and allow it to fill with water. Replace the stopper tightly before removing from the water, and then tie the rubber securely around neck and stopper. Have ready a box containing broken ice, with which the bottle should be immediately covered.

If the glass stopper can not be removed, heat the neck of the bottle with a lighted match, which will loosen it. Attach one of the labels sent you, properly filled out, numbering the samples 1, 2, 3, etc., in the order in which they are collected. *Use a lead pencil in filling out the labels for the small bottles, as ink will be blurred by water.* Wrap the bottle well in heavy paper, and as soon as possible after collecting the sample, pack the bottle in a box filled with ice and ship by express, with the samples for *chemical* examination. Make separate packages, as they go to different places in Columbus.

It is important that samples should be examined as soon after collecting as possible, and arrangements have been made to have the work done on Tuesday of each week. You will therefore please collect all samples on Mondays, and ship by the ..... Express, on the ..... R. R., leaving your city at ..... M., Monday.

It will be well to pack the large bottle in a manner to prevent breakage. All expenses for ice, packing, etc., will be paid by the State Board of Health.

I send labe's for the outside of packages. The large bottle of water is to be sent to Prof Howard, and the small one to Dr. Bleile. Be careful to label them properly.

I will keep you supplied with bottles for the collection of samples.

Respectfully,

C. O. PROBST, M. D, *Secretary.*

The sample from each place represents water from the Ohio river before it has been allowed to settle in a reservoir. But one sample is collected at each place, i. e., one for chemical and one for biological examination, except at Bellaire and Cincinnati. At Bellaire a sample is taken at the pumping station, and another from the West Virginia side of the foot of the Island just above the pumping station. At Cincinnati one sample is collected at the pumping station, and the other at a point opposite Coney Island, about twelve miles above. This is beyond the mouth of the Little Miami river, and above all sources of local contamination. Dr. W. Dickore, of the Miami Medical College, has been engaged to make the chemical analyses of the Cincinnati samples, and Dr. J. C. Olliver is doing the biological work. Owing to delays in completing arrangements for the collection of samples, the work was not commenced until about the middle of September. As the investigation was author-

ized by a special act of the Legislature, without an appropriation being made for the work, I requested the Emergency Board to allow the creation of a deficiency of fifteen hundred dollars for the expenses of the investigation. This was granted.

The Fifth Annual Report was just received from the binder, and is now being distributed. I secured 2,000 reprints of the Manual of Health Laws, which was printed as an Appendix of the report, without cost to the Board. Copies of these have been distributed to all local boards of health in the State, to all state boards of health, and have been sent to many other persons.

Respectfully submitted.

C. O. Probst, M. D.,
Secretary.

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ANNUAL REPORTS

—OF—

LOCAL BOARDS OF HEALTH,

FOR THE

YEAR ENDING OCTOBER 31, 1891.

ANNUAL REPORTS.

ADA—W. H. MORROW, H. O.

Population, 2,079.

Character and extent of improvements in sewerage:

About three miles of main sewerage, deepened and widened outlet; distance, about three-fourths of a mile; no main sewerage within a year.

Number and character of nuisances abated:

Privy-vaults, 25; cleaned and contents hauled away. We have not adopted any system for vaults yet, but we think that they should be water-tight. We have been annoyed very much with hog-pens; think that we will prohibit the keeping of hogs within the corporation next year.

Does the Board hold regular meetings?

No. They passed resolutions empowering the Health Officer to act, and his acts are final, and they ratify all of his acts.

Are the orders of the Board enforced without difficulty?

Yes, with very few exceptions.

Suits brought by the Board:

None; we refer them to the law; that settles all disputes.

Are school children required to be vaccinated?

No; there has been no small-pox scare near us for two years.

Are cases of typhoid fever reported to the Board?

Yes; we require all physicians to report all contagious and infectious diseases.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever, measles and whooping cough. Placards are removed by the Health Officer at the proper time.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, no deaths; scarlet fever, 20 cases, no deaths; typhoid fever, 15 cases, 5 deaths.

Is disinfection done under direct supervision of Board?

The Health Officer leaves one of the Board of Health pamphlets on disinfection, and then requires the attending physician to see that the rules are enforced.

Money spent by Board, including salaries:

Twenty-nine dollars; Health Officer's salary, $25.00.

AKRON—DR. A. A. KOHLER, H. O.

Population, 27,601.

Character and extent of improvements in sewerage:

About 6,500 feet of main sewers.
About 12,000 feet of private connections.

Number and character of nuisances abated:

Three thousand six hundred and twenty-nine nuisances abated, privies cleaned, disinfected, abandoned, garbage removed, sink holes filled up, houses and yards cleaned, manure removed, etc., etc.

Does the Board hold regular meetings?

Yes; first and third Friday evenings of each month.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case.

Three suits were brought by Board. One for adulterating milk, one for disobeying quarantine laws, one for not reporting case of contagious disease. All plead guilty and were fined.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician?

Scarlet fever, diphtheria, membranous croup, measles and whooping cough. The cards are removed by the Board.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 48 cases, deaths, 14; scarlet fever, 135 cases, 3 deaths; typhoid fever, 1 case, 1 death; measles, 17 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection is done under supervision of Board. The Board furnishes disinfectants.

Money spent by Board, including salaries:

About $1,475.

ALLIANCE—DR. P. W. WELKER, H. O.

Population, 7,607.

Character and extent of improvements in sewarage:

About a half mile of new sewerage put in the past year.

Number and character of nuisances abated:

Nearly one hundred, consisting of water-closets, pools of stagnant water, garbage, etc.

Does the Board hold regular meetings?

Yes, twice a month, from the first of May till November; afterwards on call of Secretary.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever and small-pox; by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, no deaths; typhoid fever, 8 deaths.

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

No.

Money spent by Board, including salaries:

Two hundred dollars.

AMELIA—DR. W. B. DOAN, H. O.

Population (estimated), 600.

Number and character of nuisances abated:

The nuisances have not been of a character that required much sanitary regulation.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

It has not been enforced.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; and are cards removed by the Board or by attending physician?

This is a small village of a few hundred inhabitants, and the last year have not had much epidemic disease. So far have not placarded, but have used all the necessary precautions.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 7 cases, 1 death; scarlet fever, 6 cases, 1 death; typhoid fever, 6 cases, 1 death; measles, 7 cases, 1 death.

Is disinfection, after death or recovery, done under direct supervision of your Board; does the Board furnish disinfectants?

It has been done under direct supervision of the Board. The Board has furnished disinfectants.

How much money was spent by your Board during the year, including salaries?

Did not keep an account, it was but a small amount; no salaries.

ANTWERP—JESSE H. BAUND, H. O.

Population, 1,331.

Character and extent of improvements in sewerage:

Main sewerage, 1,030 feet on Main street.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

Yes; once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes.

Cases of typhoid fever reported to the Board:

None.

Number of cases and deaths from infectious diseases reported during the year:

None.

Money spent by Board, including salaries:

On salaries, Health Officer, $10.00; Clerk of Board, $5.00.

ARCANUM—J. K. ALBRIGHT, H. O.

Population, 1,131.

Number and character of nuisances abated:

Thirty-seven. Character: Privy-vaults; hog-pens, stable manure in alleys, garbage at restaurants.

Does the Board hold regular meetings?

Two meetings each year, and at the call of Health Officer.

Are the orders of the Board enforced without difficulty?

They are without legal test.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard?

Diphtheria, scarlet fever, typhoid fever, whooping cough, measles.

Number of cases and deaths from infectious diseases reported during the year:

None

Is disinfection, after death or recovery, done under direct supervision of your Board?

Done under direction and inspection of Health Officer.

Money spent by Board, including salaries:

Health Officer, salary, $25.00 per annum, and ten cents each notice and permit served.

ASHVILLE—JOHN W. JOHNSON, H. O.

Population, 430

Character and extent of improvements in sewerage:

One thousand four hundred and seventy-four feet of two-foot brick sewer and seven hundred feet of ten-inch tile, at an aggregate cost of $1,191.

Number and character of nuisances abated:

From twelve to fifteen nuisances abated, such as cleansing vaults, etc

Does the Board hold regular meetings?

No. We have regularly appointed meetings but seldom meet owing to a general lack of interest in the matter.

Are the orders of the Board enforced without difficulty?

They seldom make orders; We have considerable difficulty in enforcing our orders on privy and hog-pen nuisances from a want of knowledge and appreciation.

Suits brought by Board:

None b rought.

Are school children required to be vaccinated? Is this requirement enforced?

No. Neither required nor enforced Our school system is in a bad sanitary condition from lack of manual training and a proper system of ventilation.

Are cases of typhoid fever reported to the Board?

Only one case reported, and that case was brought here from the Delaware school.

What diseases do you placard?

We placard all contagious and infectious diseases.

Number of cases and deaths from infectious diseases, reported during the year.

Diphtheria, 1 case, 1 death; typhoid fever, 1 case, no death; measles, 19 cases, no deaths; no death; whooping cough, 2 cases, 2 deaths.

Is disinfection done under the direct supervision of Board?

Yes.

Money spent by Board, including salaries.

$16.85, sum total

ASHLAND—R. A. DAVIS, H. O.

Population, 3,566.

Does the Board hold regular meetings?

Every Monday evening.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 4 cases, no deaths; scarlet fever, 5 cases, 2 deaths; typhoid fever, 35 cases, 3 deaths; measles, 2 cases, no deaths.

Is disinfection done under direct supervision of your Board?

Yes.

Money spent by Board including salaries?

$114 00.

ASHLEY—J. HARROUN, H. O.

Population, 628.

Number and character of nuisances abated?

Four. Hogs and hog-pens.

Does the Board hold regular meetings?

Do not.

Are the orders of the Board enforced without difficulty?

All except one.

Suits brought by Board:

None were brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

They have not been, but the Board has passed a resolution requiring it to be done in the future.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, measels, whooping cough, scarlet fever. The attending physician.

Number of cases and deaths from infectious diseases reported during the year.

None.

Is disinfection done under direct supervision of Board?

By the Health Officer and attending physician.

Money spent by Board, including salaries?

About $17.

ATTICA—DR. A. W. KNIGHT, H. O.

Population, 682.

Character and extent of improvements in sewerage:

From twenty to thirty rods of sewer tile put down this year.

Number and character of nuisances abated?

Not necessary to abate any.

Does the Board hold regular meetings?

Yes; every two weeks.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits brought up by Board and no trials have been had in the past year.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Our Board quarantines all cases of typhoid fever, measles, scarlet fever, diphtheria and whooping cough.

Number of cases and deaths from infectious diseases reported during the year:

None.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes.

Money spent by Board, including salaries:

Ten dollars.

BALTIMORE—DR. B. K. THOMEN, H. O.

Population, 505.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

Only when occasion required, so far.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated? Is this requirement enforced?

Yes, to both interrogations.

Are cases of typhoid fever reported to the Board?

There were none since Board was established.

Number of cases and deaths from infectious diseases reported during the year:

None.

Money spent by Board, including salaries:

None.

BARNHILL—DR. J. W. PARKHILL, H. O.

Population, 969.

Number and character of nuisances abated:

Since Board of Health was organized March 18, 1891, a majority of the privies have been put in sanitary condition, since which there have been no infectious diseases.

Does the Board hold regular meetings?

Health has been good for the last six months, and Board has not met regularly.

Are the orders of the Board enforced without difficulty?

Some kicking was done against the action of the Board, but its orders were complied with without law suits.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No special attention has been given to vaccination. Mo t of the pupils have been vaccinated at some time.

Are cases of typhoid fever reported to the Board?

A year previous to the organization of Board there were one hundred cases of typhoid fever, but have had no cases since village was policed.

What diseases do you placard?

There have been no infectious diseases here this year, and therefore none to placard.

Money spent by Board, including salaries:

Board not a year old; $10.00 per month was paid to Sanitary Pol ce and Secretary each for a month, but their sa aries have been reduced to $4.00 each per month since town was cleaned.

BEDFORD—F. E. HOUTS, H. O.

Population, 1,043.

Number and character of nuisances abated:

Ten privy-vaults.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes, so far.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Small-pox, diphtheria, scarlet fever, typhoid fever, measles, whooping cough, mumps. By the attending physician generally.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 3 cases no deaths; whooping cough, 4 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

This is something the Board is slack about and need censure for.

Money spent by Board, including salaries:

About $50.

BELLEFONTAINE—DR. C. W. HEFFNER, *Sec'y*

Population, 4,245.

Number and character of nuisances abated:

I do not know how many, but a number of hog-pens, manure piles, old privy-vaults, cellars full of water and dirt, etc.

Does the Board hold regular meetings?

Through the summer months we try to meet every Friday evening.

Are the orders of the Board enforced without difficulty?

The orders of the Board are fairly well enforced and with little or no difficulty.

Suits brought by the Board:

It has not been necessary.

Are school children required to be vaccinated? Is this requirement enforced?

I think we have a regulation that school children be vaccinated, but it is not enforced.

Are cases of typhoid fever reported to the Board?

Not as a rule. If we accidentally find them I report them to State Board.

What diseases do you placard; are cards removed by Board or by attending physician?

Scarlet fever, diphtheria, measles. The cards are usually taken down by the family as soon as

the patient is discharged—this way will likely be corrected hereafter.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, 1 death; scarlet fever, 5 cases, no deaths; typhoid fever 3 cases, 2 deaths; whooping cough, 3 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board usually speaks to the physician in attendance to see after disinfection and then pays no further attention.

Money spent by Board, including salaries:

Possibly $175 to $200. The salaries amount to $150.

BELLVILLE—Dr. T. T. Austin, H. O.

Population, 911.

Number and character of nuisances abated:

Two bad privies.

Does Board hold regular meetings?

Quarterly.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Small-pox.

Number of cases and deaths from infectious diseases, reported during the year:

None.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No Physicians ordered to furnish.

How much money was spent by your Board during the year, including salaries?

None.

BELLEVUE—John Earls, H. O.

Population, 3,052.

Number and character of nuisances abated.

Privies cleaned out, dead animals removed and stagnant water and cess pools removed.

Does the Board hold regular meetings?

Yes. Monthly.

Are the orders of the Board enforced without difficulty?

Most of them.

Suits brought by Board:

None.

Are school children required to be vaccinated?

Yes. Enforced when there is any fear of small-pox.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Scarlet fever, diphtheria, small-pox.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 6 cases, no deaths; typhoid fever 5 cases, 1 death

Is disinfection done under direct supervision of Board?

No.

Money spent by Board including salaries?

About $75.00.

BEREA—T. G. Card, H. O.

Population, 2,533.

Character and extent of improvements in sewerage:

Sewer No. 2 just completed, which makes good sewerage for this city.

Number and character of nuisances abated:

Hog-pens and privies, 5; two places of stagnant water.

Does the Board hold regular meetings?

Yes; once a month.

Are the orders of the Board enforced without difficulty:

Nearly every time.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No call for vaccination.

Are cases of typhoid fever reported to the Board?

Not usually; Board has looked sharp after them.

What diseases do you placard?

Have had no occasion to place cards, but would have done so for contagious diseases.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 deaths; scarlet fever, 1 death; measles, 1 death

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No.

Money spent by Board, including salaries:

No salaries.

BETHEL—Dr W. E. Thompson.

Some four or five years ago a Board of Health was organized in this village, but this was the last of it, for there never was a meeting held afterward. There is no village in Southern Ohio more favorably located for health, and it is a rare thing for disease of any kind to prevail to such an extent as to excite any alarm. Consequently no interest has been taken by the Board appointed.

BLANCHESTER—Dr. S. B. Judkins, H. O.

Population, 1,196.

Number and character of nuisances abated:

One removed by Health Officer, water-ways opened, and one shed removed by Health Officer; cost, $5 00.

Does the Board hold regular meetings?

No. In the winter months we have meetings upon call of the Health Officer

Are the orders of the Board enforced without difficulty?

Yes, very little trouble.

If suits were brought by the Board, give character and results of trial in each case:

One suit was brought against undertaker for burying without a permit. He was fined a nominal sum.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Diphtheria, scarlet fever, typhoid fever, measles, whooping cough.

Number of cases and deaths from infectious diseases reported during the year:

None.

Is disinfection, after death or recovery, done under direct supervision of your Board?

No.

Does the Board furnish disinfectants?

No.

Money spent by Board, including salaries:

Salary of Health Officer sixty dollars per year, nothing more.

BLOOMINGBURG—J. J. Pinkerton, H. O.

Population, 638.

Number and character of nuisances abated:

Sixteen privies renovated and removed; hog-pens and all garbage kept cleaned away.

Does the Board hold regular meetings?

No. Only as required.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board?

None.

Are school children required to be vaccinated? Is this requirement enforced?

Yes, in both cases.

Are cases of typhoid fever reported to the Board?

Yes, or to me by physicians.

What diseases do you placard?

Typhoid fever, whooping cough, diphtheria, measles, scarlet fever, small-pox and cards are removed by order of physicians by health officer.

Number of cases and deaths from infectious diseases, reported during the year:

Typhoid fever, 9 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No. Done by physicians or by their order.

Money spent by Board including salaries:

None; all help was received from township poor fund; salary $27, to health officer, is all.

BLOOMVILLE—Dr. J. W. Hoy, H O.

Population, 758.

Number and character of nuisances abated:

Seven privy-vaults, pig-pens, stagnant water and refuse from sick rooms.

Does the Board hold regular meetings?

Appointed time—second Wednesday of each month but meet only on call of health officer.

Are the orders of the Board enforced without difficulty?

In all instances except one family, with whom the board have had trouble.

Suits brought by the Board:

For resisting health officer and sanitary police

in investigating premises—fine $5 and costs of prosecution.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes

What diseeases do you placard?

Diphtheria, scarlatina and typhoid fever.

Number of cases and deaths from infectious diseases reported during the year.

Diphtheria, 7 cases, 3 deaths; typhoid fever, 3 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

Disiufection by direction of Board but not under their immediate supervision.

Money spent by Board, including salaries:

$60.

BOWERSTON—Dr E. E. McPeck, H. O.

Population (estimated) 750.

Number and character of nuisances abated?

Fifteen or twenty bad privy-vaults cleaned and abated. A number of hog-pens cleaned.

Does the Board hold regular meetings?

Once in two weeks during July, August and September.

Are the orders of the Board enforced without difficulty?

This being the first year, they were not.

Are school children required to be vaccinated?

No action taken by the Board.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

None as yet.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, no deaths; typhoid fever, 3 cases, no deaths; measles, epidemic, 2 deaths; whooping cough, 2 or 3 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

None.

BROOKLYN—R. E. Stickney, H. O.

Population, 4,585.

Number and character of nuisances abated:

Eight nuisances; one for throwing slops around a well.

Does the Board hold regular meetings?

They hold a meeting once a month.

Are the orders of the Board enforced without difficulty?

No.

Suits brought by Board:

None.

Are school children required to be vaccinated?

They are not.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard; are cards removed by Board or attending physician?

Diphtheria scarlet fever, typhoid fever, whooping cough, measles. By the attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 5 cases, no deaths; typhoid fever 2 cases, 1 death; measles, 1 case.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board furnishes all disinfectants.

Money spent by Board, including salaries:

Thirty dollars.

BRYAN—S. T. Martin, H. O.

Population, 3,068.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

There are no orders adopted by the Board to enforce.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard:

No disease placarded.

Number of cases and deaths from infectious diseases reported during the year:

No cases reported during the year.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board does not furnish disinfectants.

Money spent by Board, including salaries:

None. The Board of Health does not take any interest in the health of our town.

BUCYRUS—DR. C. H. NOBLET, H. O.

Population, 5,974.

Number and character of nuisances abated:

Hog-pens removed, about 25; privies cleaned, about 300. We have all the alleys cleaned two to three times a season.

Does the Board hold regular meetings?

We hold regular meetings once a month.

Are the orders of the Board enforced without difficulty?

Yes, with very few exceptions.

If suits were brought by the Board, give character and results of trial in each case:

Our rule is for no privy-vaults to be tapped. In case any one does we take him before the Mayor and he is fined; they never stand suit.

Are school children required to be vaccinated? Is this requirement enforced?

Yes, whenever small-pox is near our place.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Typhoid fever, scarlet fever, diphtheria and measles. Cards are removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 3 deaths; scarlet fever, 3 cases, no deaths; typhoid fever, 5 cases, 1 death; measles, 2 cases, no deaths; whooping cough, 20 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

It is done by the physician, under our direction; each one furnishes his own.

Money spent by Board, including salaries:

Eight hundred and forty dollars.

BYESVILLE—M. W. PETERS, H. O

Population, 789.

Number and character of nuisances abated:

Four privies.

Does the Board hold regular meetings?

One a week.

Are the orders of the Board enforced without difficulty?

No.

If suits were brought by the Board, give character and results of trial in each case:

One case for violating an order of Board and the Mayor held him to answer to grand jury, and the case was dropped.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

Money spent by Board, including salaries:

Salaries, none. About twenty dollars spent in removing filth.

CADIZ—MRS. M. J. LYONS, M. D., H. O.

Population, 1,716.

Number and character of nuisances abated:

Several privies in rear of business houses; also pig-styes within the corporation. Do not know the number as I was not required—save in one case—to issue written order.

Does the Board hold regular meetings?

No Meetings are appointed when there is business to require them.

Are school children required to be vaccinated?

No

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard? Are cards removed by Board or attending physician?

Scarlet fever, diphtheria and measles. Cards are removed by Board.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 4 cases, no deaths; typhoid fever, 6 cases, no deaths.

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

No.

Money spent by Board including salaries:

Not exceeding one hundred dollars.

CALDWELL—DR. O. O. MCKEE, H. O.

Population, 1 248.

Number and character of nuisances abated:

We have removed all privy-vaults, prohibit the keeping of hogs in town.

Does the Board hold regular meetings?

Every two months.

Are the orders of the Board enforced without difficulty?

Some difficulty, but with less trouble this year than previous.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

We do not placard any, as we have not had any cases outside of typhoid fever.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 12 cases, 3 deaths; whooping cough, 8 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Seventy-five dollars.

CALEDONIA—J. W. PATTEN, H. O.

Population, 757.

Number and character of nuisances abated:

Have had none during life of Board which was organized September 21, 1891.

Does the Board hold regular meetings?

Yes, once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

Have had none.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician:

Scarlet fever and diphtheria. Health Officer does the placarding and removing.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 3 cases no deaths; scarlet fever, 36 cases, no deaths; whooping cough, 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Have not been organized long enough to draw our lucre.

CANAL DOVER—DR. T. H. BRANNAN, H. O.

Population, 3,470.

Number and character of nuisances abated:

A few hog-pens and bad privies.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

No; physicians pay no regard to reporting cases of contagious diseases.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Is disinfection done under direct supervision of Board?

Board pays no regard to disinfection.

Money spent by Board, including salaries:

Nothing outside of salaries.

CANAL FULTON—JOSEPH MILLER, H. O.

Population, 1,173.

Number and character of nuisances abated:

All abated with the exception of one, that being a Company Creamery in the corporation, containing between fifty and sixty hogs, and the Company refuse to comply with the Board of Health laws.

Does the Board hold regular meetings?

Every two months.

Are the orders of the Board enforced without difficulty?

Yes, with the exception of one doctor.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

All infectious diseases. By the Board, order of the physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, 2 deaths; typhoid fever, 1 case, no deaths

Is disinfection done under direct supervision of Board?

Yes.

Money spent by Board, including salaries:

Two hundred and twenty five dollars.

CANAL WINCHESTER—L. W. BEERY, H. O.

Population, 633.

Number and character of nuisances abated:

A general cleaning up of the town last spring.

Does the Board hold regular meetings?

No. They should meet once per month, but have not had a quorum for six months.

Are the orders of the Board enforced without difficulty?

No.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No They were about three years ago but none since.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Have placarded none.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 2 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

They have paid no salaries during the year, but agreed to pay Health Officer $45.00 and Sanitary Police $25.00.

CAREY—DR. J. D. SOUTHWARD, H. O.

Population 1,605.

Number and character of nuisances abated.

Eleven; privy-vaults, slaughter-house, pigpens, etc.

Does the Board hold regular meetings?

Yes, the 4th of each month except November, December, January and February.

Are the orders of the Board enforced without difficulty?

Generally.

Were suits brought by the Board?

No.

Are school children required to be vaccinated?

No.

What diseases do you placard?

All contagious diseases.

Are cards removed by the Board, or by attending physician?

The physician in charge.

Number of cases and deaths from infectious diseases, reported during the year:

Diptheria, 12 cases, no deaths; typhoid fever, 1 case, 1 death.

Is disinfection done under direct supervision of Board?

No.

CARTHAGE—HARRY ROSS, H. O.

Population, 2,257.

Number and character of nuisances abated:

One overflowing sewer, one privy-vault, thirteen for allowing kitchen slops to be drained to street.

Does the Board hold regular meetings?

Once per month.

Are the orders of the Board enforced without difficulty?

Have had but very little trouble.

Suits brought by Board:

Had one undertaker arrested for failing to get a burial permit for which he was fined th costs.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board:

No.

What diseases do you placard?

Diphtheria, small-pox, yellow fever, cholera, scarlet fever.

Are cards removed by the Board or by attending physician?

The health officer always removes the cards upon order of physician.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 14 cases, 8 deaths; scarlet fever 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

We furnish disinfectants if parties are unable to provide same.

Money spent by Board, including salaries:

Salary of health officer and clerk, $150.00, printing, etc., $3.15; Total, $153.15.

CEDARVILLE—James E. Townsley, H. O.

Population, 1,355

Number and character of nuisances abated:

One slaughter-house.

Does the Board hold regular meetings?

Yes; once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

Yes; but not strictly enforced.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria and scarlet fever.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, no deaths; scarlet fever, 7 cases, no deaths; typhoid fever, 4 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

One hundred dollars.

CELINA—Dr. D. H. Richardson, H. O.

Population, 2,702.

Number and character of nuisances abated:

One pond of stagnant water, 29 hog-pens, 2 slaughter-houses, 1 privy-vault, 1 alley and lot of weeds and rubbish.

Does the Board hold regular meetings?

Nonthly.

Are the orders of the Board enforced without difficulty?

Not in all cases.

If suits were brought by the Board, give character and result of trial in each case:

Charles N., fined $1 for keeping hogs, paid fine and removed hogs. Philip B., fined $2 for selling meat without permit, paid fine and obtained permit. Joseph B., fined $1 for slaughtering inside of village; had 1 vault cleaned and expense placed on tax duplicate for collection.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, measles and whooping cough. Cards are removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 3 cases, no deaths; scarlet fever, 5 cases, no deaths; typhoid fever, 10 cases, 1 death; measles, 2 cases, no deaths; whooping cough, 3 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Not in all cases. The Board does not furnish disinfectants.

Money spent by Board, including salaries:

Three hundred and thirty-seven dollars and thirty-three cents ($337.33).

CHICAGO—DR. D. H. YOUNG, H. O.

Population, 1,299.

Number and character of nuisances abated:

There have been none, only privy-vaults and privies that are on the surface—about 300 of them; 28 hog-pens that have to be looked after. The council will not restrict them; have had 4 cellars cleaned and the houses renovated on account of absolute filth; all done at the expense of the property.

Does the Board hold regular meetings?

Every second Tuesday of the month, but do not meet at all regularly.

Are the orders of the Board enforced without difficulty?

Comparatively so; have to order two or three times.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes, with two exceptions.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria and scarlet fever. By attending physician and returned to Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 1 death; scarlet fever, 6 cases, no deaths; typhoid fever, 4 cases, 1 death; whooping cough, 6 cases, no deaths.

Is disinfection done under direct supervision of Board?

No; under the direction of attending physician.

Money spent by Board, including salaries:

Can not say, about $13, I think; can not find any record. The condition of the town is good, but is owing more to good luck than management.

CHILLICOTHE—DR. JAMES D. MILLER, H. O.

Population, 11,288.

Number and character of nuisances abated:

There have been fifty-one nuisances abated in city, to-wit: 21 hog-pens, 17 privies, and 13 manure nuisances, and a variety of smaller ones.

Does the Board hold regular meetings?

Second and fourth Mondays of each month.

Are the orders of the Board enforced without difficulty?

With the educated without difficulty; uneducated some trouble; with colored a great deal of trouble generally.

Suits brought by Board:

The orders of the Board have finally been obeyed, and suits entered were dismissed.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Diphtheria, scarlet fever, typhoid fever, measles and whooping cough.

Are cards removed by the Board or by attending physician?

Placards removed by Sanitary Police, by notice of attending physician or Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 30 cases, 4 deaths; scarlet fever, 22 cases, 4 deaths; typhoid fever, 23 cases, 3 deaths; measles, 30 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The attending physician gives orders and the Sanitary Police supervise the disinfecting. The Board supplies disinfectants in case of need.

Money spent by Board, including salaries:

Thirteen hundred and ninety-eight dollars and twenty cents.

CINCINNATI—DR. J. W. PRENDERGAST, H. O.

Population, 296,908.

Character and extent of improvements in sewerage:

3.61 miles of brick sewer, 2½ to 8 feet in diameter; 9.22 miles of pipe sewer, 12 to 24 inches in diameter, making a total of 12.83 miles of sewers.

Number and character of nuisances abated:

There have been 9,262 full and foul vaults reported and 30,687 miscellaneous nuisances; of the total number 39,949, 39,102 have been abated.

Are the orders of the Board enforced without difficulty:

Yes.

If suits were brought by the Board, give character and results of trial in each case:

There were a total of 138 suits brought, which may be classified as follows:

PROSECUTIONS FOR VIOLATIONS OF DAIRY AND MILK RULES AND REGULATIONS.

Selling skim milk—		
Convicted	7	
Jury disagreed	1	
Pending	1—	9
Selling adulterated milk—		
Convicted	33	
Acquitted	4	
Jury disagreed	2	
Pending	3—	42
Selling without permit—		
Convicted	11	
Acquitted	1	
Pending	2—	14
Miscellaneous—		
Convicted	1	
Acquitted	2	
Pending	2—	5
Nuisance cases—		
Convicted	19	
Acquitted	6	
Pending	1—	26
Market cases—		
Convicted	23	
Acquitted	6—	29
Selling unwholesome provisions—		
Convicted	2	
Acquitted	1—	3
Miscellaneous civil cases won	10—	10
Total		138

Total fines and costs collected, $2,864.50.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; and are cards removed by the Board or by attending physician?

Small-pox, by the department.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1,512 cases, 298 deaths; scarlet fever, 1,187 cases, 56 deaths; typhoid fever, 211 cases, 189 deaths; measles, 1 606 cases, 11 deaths; whooping cough, 30 cases, 12 deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

When requested the department will disinfect, and in cases of necessity furnish disinfectants.

Money spent by Board, including salaries:

Forty-nine thousand two hundred and forty-four dollars and fifty cents.

CLARINGTON—JOHN S. MORRILL, H. O.

Population, 762.

Number and character of nuisances abated:

Council concluded that salary of health officer, $20 per year, and salary of clerk of board of health, $15 per year, was a useless expenditure, and therefore, the board of health has been discontinued for about a year.

CLIFTON—DR. WM. HERBERT BELL, H. O.

Population, 1,575.

Number and character of nuisances abated:

The number of nuisances abated was as follows: Improper sewerage connection, 3; stagnant water 1; vaults cleaned, 4; Total, 8.

Does the Board hold regular meetings?

The Board meets the first Tuesday of each month.

Are the orders of the Board enforced without difficulty?

As a rule orders are promptly obeyed.

Suits brought by the Board:

No suits have been instituted by the Board.

Are school children required to be vaccinated?

The school children have not been required to be vaccinated?

Are cases of typhoid fever reported to the Board?

Cases of typhoid fever are not reported to the Board.

What diseases do you placard?

No diseases are placarded.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 9 cases, 3 deaths; scarlet fever, 10 cases, no deaths; typhoid fever, 1 case, 1 death; measles, 2 cases, no death; whooping cough, 2 cases, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board does not furnish disinfectants as a rule; disinfection after death or recovery has not been done under the direct supervision of the Board.

Money spent by Board, including salaries:

The expenditure from the sanitary fund for all purposes was $1 057 06.

COLLINWOOD—Dr Alvan L. Waltz, H. O.

Population (estimated), 2 500.

Number and character of nuisances abated:

Abated 8. Dead dog and horse buried contrary to law; rotten meat under a brick pile after a fire; ordinance enforced in constructing out-houses; foul pig-pen abated; foul water under dwelling.

Does the Board hold regular meetings?

Yes: first and third Monday of each month.

Are the orders of the Board enforced without difficulty?

Generally.

Suits brought by the Board:

One. A man arrested for not removing a nuisance after having been ordered to do so by the Board. Plead guilty and fined the costs.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever and measles. By attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, no deaths; scarlet fever, 20 cases, 1 death; typhoid fever, 4 cases, no deaths; measles, 4 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Families disinfect under the instructions of the Board. No.

Money spent by Board, including salaries:

Salaries and general expenses	$164 30
Printed matter	11 20
Removal of night soil about	900 00
Total	$1,075 50

CONNEAUT—Dr E. D. Merriam, H. O.

Population, 3,241.

Number and character of nuisances abated:

Number not noted. Privy-vaults, cess-pools, hog-pens, garbage heaps, etc.

Does the Board hold regular meetings?

Monthly meetings appointed, but not more than three or four held in the year.

Are the orders of the Board enforced without difficulty?

Yes; except in a very few cases.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever, measles, whooping cough. By attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 1 case, no death; typhoid fever, 11 cases, 1 death; measles, 25 cases, no deaths.

Is disinfection done under direct supervision of Board:

Board has never furnished disinfectants.

Money spent by Board, including salaries:

About $200.

COSHOCTON—Isaac Hagans, H. O.

Population, 3,672.

Number and character of nuisances abated:

Forty-five privy-vaults, 3 from hog-pens, 1 from other causes; 3 premises caused to be vacated as unfit for healthful habitation.

Does the Board hold regular meetings?

Generally not regular—mostly on call.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

Not as yet.

Are cases of typhoid fever reported to the Board?

Yes, in part only.

What diseases do you placard; are cards removed by the Board or by attending physicians?

Typhoid fever, scarlet fever and measles. Both.

Is disinfection done under direct supervision of Board?

No. The physicians attend to that furnishing their own disinfectants.

Money spent by Board, including salaries:

Not to be exact, data not at hand, about $182.

Soil in town plat such as to allow easy percolation of liquids from surface, privy-vaults and cess-pools, thus contaminating all well water in the town to a dangerous extent. The water-works will remedy this extensively.

CRESTLINE—Dr. G. R. Edwards, H. O.

Population, 2,911.

Number and character of nuisances abated:

Some attention has been given to privy-vault and hog-pen nuisances during the summer.

Does the Board hold regular meetings?

Have never heard of any.

Are orders of the Board enforced without difficulty?

No.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Is disinfection done under the direct supervision of Board?

No.

Money spent by Board, including salaries:

None.

CRIDERSVILLE—James P. Church, H. O.

Population, 465.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

The Board organized in October and has held no meetings since.

Are the orders of the Board enforced without difficulty?

They have been so far.

Suits brought by the Board:

There have been no suits brought.

Are school children required to be vaccinated?

I do not know what rules they have made in regard to vaccination I presume they will be required to vaccinate if necessary.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard?

Diphtheria, scarlet fever, small-pox, and all other dangerous, contagious or infectious diseases.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 8 cases, 3 deaths

Is disinfection done under direct supervision of Board?

No.

DALTON—John M. Fiscus, H. O.

Population, 610.

Number and character of nuisances abated:

The Board has not met since July 26, 1890, when our Health Officer resigned, and our Board has not had a quorum since.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No; there was only one case.

What diseases do you placard; are cards removed by the Board or by attending physician?

Contagious. Cards removed by the physician.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, no death.

Is disinfection done under direct supervision of Board?

Never had a case yet.

Money spent by Board, including salaries:

None at all.

DAYTON—DR. A. H. IDDINGS, H. O.

Population, 61,220.

Character and extent of improvements in sewerage:

Just introduced—not completed. 13 miles now completed. 150 attachments made—works well. Have the separate system.

Have water-works been introduced? If so, give source of supply:

Yes—40 tube wells about 50 feet deep in the bed of the river—25 more wells being now made. Water, the best in the world—4,000 attachments. 20,000 consumers.

Does the Board hold regular meetings?

Yes—two per month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria, membranous croup and scarlet fever.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria 281 cases, 50 deaths; scarlet fever, 96 cases deaths, 3; typhoid fever, — cases, 15 deaths; measles, — cases, 1 death: whooping cough, — cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No, except where obstinacy or indifference upon the part of the family requires it.

Money spent by Board, including salaries:

Two thousand nine hundred and forty-six dollars and ninety-five cents.

DELPHOS—DR. J. M. MARSH, H. O.

Population, 4,516.

Character and extent of improvements in sewerage:

The town is well supplied with sewers. About one hundred and forty rods have been put in the last year. New catch basins and traps have also been put in.

Number and character of nuisances abated:

The pig-pen nuisance has been abolished; many privy-vaults cleaned out; all connection of privies with sewer has been abolished. Several wells have been condemned. Traps have been placed in sewers to prevent escape of sewer gas.

Does the Board hold regular meetings?

The Board holds regular meetings once a month.

Are the orders of the Board enforced without difficulty?

The orders of Board are enforced without difficulty.

Are school children required to be vaccinated?

The children are required to be vaccinated at times of threatened epidemic.

Are cases of typhoid fever reported to the Board?

Typhoid is reported to Board

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, small-pox and measles are placarded. The cards are removed by Board.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 3 cases, 1 death; scarlet fever, 2 cases, 1 death; typhoid fever, 10 cases, 1 death; whooping cough not reported

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection after death or recovery is under supervision of Board. Board does not furnish disinfectants except to those in destitute circumstances.

Money spent by Board, including salaries:

Three hundred and seventy-five dollars.

DELTA—Dr. S. P. Bishop, H. O.

Population, 1,132.

Number and character of nuisances abated:

Fifteen hog-pens, twenty accumulations of animal offal and garbage in alleys.

Does the Board hold regular meetings;

Yes, every month, fourth Monday, with occasional semi-monthly meetings.

Are the orders of the Board enforced without difficulty?

Very generally, they are.

Suits brought by Board:

None.

Are school children required to be vaccinated?

Only in times of threatened invasion of small-pox.

Are cases of typhoid fever reported to the Board?

We have not insisted on that until now. We commence requiring it.

What diseases do you placard?

Scarlet fever and diphtheria.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 5 cases, no deaths; scarlet fever, 12 cases no deaths; typhoid fever, 6 cases, no deaths; whooping cough, 3 cases, no deaths.

Is disinfection done under direct supervision of Board?

We depend on the attending physician and the family furnishes the disinfectants.

Money spent by Board, including salaries?

Not to exceed $5 for printing. No salaries.

DOYLESTOWN—Dr. A. E. Steffield, H. O.

Population, 1,131.

Number and character of nuisances abated:

There have been no nuisances abated, although the Health Officer has asked to have burials forbidden in the cemeteries within the corporate limits as we have a beautiful cemetery just out of the corporation which drains away from the village. The hog-pen is a live nuisance, but there seems to be timidity in dealing with it.

Does the Board hold regular meetings?

Our meetings are held upon call of the Mayor, and we meet from four to six times each year.

Are the orders of the Board enforced without difficulty?

Have had but little trouble in enforcing orders, and the people generally are inclined to favor all sanitary improvements. The country people are the most difficult to deal with, which is owing to the old-time custom of burying the family in the same burying plot, and the old cemeteries are common property, belonging to all members of the same church where the grounds are connected.

Are school children required to be vaccinated?

We have made no requirement thus far, but shall endeavor to have that done during the coming year, believing it a wise move.

Are cases of typhoid fever reported to the Board?

They are; but happy to say we have had none during the past three years.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, t phold fever, small-pox, measles. Cards are removed by attending physician upon conference with Health Officer

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 43 cases, 1 death; measles, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfectants are used on recommendation of the Board but not furnished.

Money spent by Board, including salaries:

Printing, $22.75; Health Officer's salary, $35 00

ELMWOOD PLACE—John H. Bart, H. O.

Population, 1,980.

Number and character of nuisances abated:

Twenty-two. Repairing drains and vaults, removing dead animals.

Does the Board hold regular meetings?

Yes, monthly.

Are the orders of the Board enforced without difficulty?

Almost entirely so.

If suits were brought by the Board, give character and results of trial in each case.

Two warrants were ordered sworn out by Board of Health for year ending November 31. First case was for the arrest of a physician for failing to report a case of diphtheria. Mayor

held that a case had not been held. Same was dismissed. Second case was that a vault-cleaner was depositing night soil in a running stream. Defendant waived examination and was bound over to grand jury of Hamilton county.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; and are cards removed by the Board or by attending physician?

Scarlet fever, diphtheria, small-pox, typhoid fever. Cards removed by Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 19 cases, 5 deaths; scarlet fever, 22 cases, no deaths; typhoid fever, 2 cases, 1 death; measles, 2 cases, 1 death; whooping cough cases not reported.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

One hundred and eighty-one dollars and forty-eight cents.

FAIRPORT HARBOR, J. V WINANS, *Clerk of Board of Health.*

Population (estimated), 1,000.

Number and character of nuisances abated:

No record has been kept, Health Officer having notified property owners to remove nuisances as necessity required.

Does the Board hold regular meetings?

Yes, first Friday of each month.

Are the orders of the Board enforced without difficulty?

No. A few are obstinate.

Suits brought by the Board:

No suits

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes

What diseases do you placard; and are cards removed by the Board or by attending physician?

As yet none have been placarded. Board will soon begin to placard diphtheria, scarlet fever and small-pox. Cards will be removed by Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 12 cases, 2 deaths; measles, 4 cases, no deaths. Report estimated.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Ninety dollars.

FELICITY—DR. C. E. HOUGHTON, H. O.

Population, 779.

Number and character of nuisances abated:

Quite a number, hog-pens and privies mostly.

Does the Board hold regular meetings?

No: every thing is done under the direction of the Health Officer, and meetings called by him in cases of dispute, etc., etc.

Are the orders of the Board enforced without difficulty?

Lately, yes. We have had some difficulty in enforcing rules, but since the community found we meant business we have had no trouble.

Were suits brought by the Board?

There have been no suits brought by the Board.

Are school children required to be vaccinated?

In extreme cases, yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria and scarlet fever. Cards are removed by the Board after receiving a certificate from the attending physician that all danger of contagion is past.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, 1 death; typhoid fever, 1 case, no deaths

Is disinfection done under direct super-

vision of Board; does the Board furnish disinfectants?

To both questions, yes.

Money spent by Board, including salaries:

About $75.

FINDLAY—CHAS. SHIRTLIFF, H. O.

Population, 18,553.

Character and extent of improvements in sewerage.

One mile constructed of brick, about four feet in diameter.

Number and character of nuisances abated:

From May to October 31, 1891: Privy-vaults, 920; garbage, 380; hog pens, 38; dead animals, 80. Owing to low stage of water in river quite a number of fish died and were removed by orders from the Board, and a portion of the river bed was flushed with assistance from fire department.

Does the Board hold regular meetings?

Yes, weekly.

Are the orders of the Board enforced without difficulty?

Some difficulty owing to opposition from council.

Suits brought by Board:

No arrests up to October 31.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever, measles, whooping cough, small-pox. By Board

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 39 cases, 10 deaths; scarlet fever, 14 cases, no deaths; typhoid fever, 17 cases, 5 deaths; measles, 4 cases, no deaths; whooping cough, 4 cases, 1 death. Physicians not required to report deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board including salaries?

One thousand six hundred and ninety dollars and seventy-nine cents from May to October 31.

This report is for six months ending Oct. 31, 1891.

FOREST—DR. W. N. MUNDY, H. O.

Population, 1,126.

Number and character of nuisances abated:

Have none this past year, simply keep town as clean as possible.

Does Board hold regular meetings?

Should meet the second Tuesday evening of each month; have held six meetings.

Are the orders of the Board enforced without difficulty?

Usually they are.

Were suits brought by the Board:

Have not had any suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Not by the physicians. They disregard orders of Board.

What diseases do you placard?

None.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 10 cases, 4 deaths; scarlet fever, 1 case, no deaths; typhoid fever, 1 death; whooping cough epidemic.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Health Officer, $10 per month.

FOSTORIA—J. O. HESS, H. O.

Population, 7,070.

Character and extent of improvements in sewerage:

We commenced building sewerage August, 1891, and have about two miles completed.

Number and character of nuisances abated:

We have had all slaughter-houses moved out of corporation. Have cleaned four hundred and forty-five vaults. Removed all dead animals.

Does the Board hold regular meetings?

The Board has regular meetings every month

Are the orders of the Board enforced without difficulty?

They are.

Suits brought by the Board:

No suits brought.

Are school children required to be vaccinated?

They are, but not enforced.

Are cases of typhoid fever reported to the Board?

No; but I wish you would require them to do it.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, measles; the cards are removed by Health Officer under direction of physician.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 6 cases, 3 deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

It is. The Board furnishes disinfectants.

Money spent by Board, including salaries:

Six hundred dollars.

FRAZEYSBURG—Dr. J. A. Parks, H. O.

Population, 610.

Number and character of nuisances abated?

None.

Does the Board hold regular meetings?

Yes, first Monday evening of each month.

Are the orders of the Board enforced without difficulty?

No, they are not.

Suits brought by the Board:

We have not brought any suits as yet.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

We have not had any typhoid in the corporation.

What diseases do you placard?

We have not placarded any yet.

Number of cases and deaths from infectious diseases, reported during the year:

Measles, 15 cases, no deaths

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

The Board was just organized this July.

FREMONT—Dr. F. S. Hillbish, H. O.

Population, 7,141.

Character and extent of improvements in sewerage:

A trunk sewer one-half mile in length to empty below the town connecting sewers from eight streets emptying into it. One mile sewer tile from eight inches to one and one-half feet in diameter.

Number and character of nuisances abated:

Seven dead animals buried, 48 cellars and yards cleaned, 33 privy-vaults cleaned, 25 pigpens cleaned, 47 manure and rubbish, 52 new (water-tight) vaults.

Does the Board hold regular meetings?

No, only when occasion demands.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by Board:

No suits this past year.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever, measles. By the Board.

Number of cases and deaths from infectious diseases, reported during the year.

Diphtheria, 5 cases, 3 deaths; scarlet fever, 1 case, no death; typhoid fever, 4 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Done under direction of health officer by the undertaker; no.

Money spent by Board, including salaries?

Seven hundred dollars.

GAMBIER—DR E. J. HYATT, H. O.

Population, 660.

Number and character of nuisances abated?

Privy-vaults principally.

Does the Board hold regular meetings?

Once a month.

Are the orders of the Board enforced without difficulty?

Yes, so far.

Suits brought by the Board?

No suits.

Are school children required to be vaccinated?

Has not been enforced.

Are cases of typhoid fever reported to the Board?

Will be if there are any.

What diseases do you placard?

Have not had any occasion to placard since I have been in office

Number of cases and deaths from infectious diseases reported during the year:

Have not had any contagious diseases since I have been Health Officer.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Not more than two or three dollars.

GARRETTSVILLE—DR. LUTHER LEE JOHNSON, H. O.

Population, 1,046.

Number and character of nuisances abated:

Six during year. 1. Removal of a large turtle left on one of the principal streets. 2 Three privies cleaned by order. 4. One hog-pen cleaned by order. 5. One removal of animal from Silver Creek.

Does the Board hold regular meetings?

Meets the last Saturday night of each month.

Are the orders of the Board enforced without difficulty?

Yes, as a rule.

If suits were brought by Board, give character and results of trial in each case:

One arrest. Business man for dumping eggs and egg solution in Silver Creek. Pleaded guilty, and was assessed a fine of $1.00 and costs, which was paid.

Are school children required to be vaccinated?

Not required to be vaccinated.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; and are cards removed by the Board or by attending physician?

We have not used placards, but have contemplated their use, and should think it advisable to have cards removed by Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 5 cases, 1 death; typhoid fever, 1 case, no deaths; measles, 10 cases, no deaths; whooping cough, 25 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Board does not furnish disinfectants, but rooms are always disinfected after any contagious disease.

Money spent by Board, including salaries:

None; no salaried officers.

GENEVA—DR. GEORGE W. FOSTER, H. O.

Population, 2,194.

Number and character of nuisances abated:

Privies—Acted upon, 220. Slaughter-houses—Three have been kept in good sanitary condition, been thoroughly inspected, disinfected and often cleaned. Private drains. 15; cellars, 12; hog-pens, 8; wells and ditches, 5; dead horses, cats and dogs, 4; manure piles, 6, and all garbage in alleys, around business blocks, public buildings, dwellings, etc., scraped up and carted to dump ground and cremated.

Does the Board hold regular meetings?

It meets once every month.

Are the orders of the Board enforced without difficulty?

They are.

Suits brought by the Board:

No suits brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; and are

cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever, whooping cough, measles, and all infectious diseases. Cards removed by Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 2 deaths; scarlet fever, 6 cases no deaths typhoid fever, 4 cases, 2 deaths; measles, 2 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board sees that disinfection is attended to after death or recovery. The Board does not always furnish but advises disinfectants.

Money spent by Board, including salaries:

One hundred and fifty-five dollars.

GLENVILLE—CHAS B. COOK, H. O.

Population (estimated), 1,616.

Number and character of nuisances abated:

Eighty-three; cleaning of privies, removal of manure piles, removing and burying of dead animals, and we compel gardeners to plow under refuse cabbage after crop is removed.

Does the Board hold regular meetings?

We meet the first Tuesdays of each month, but do not always have a quorum.

Are the orders of the Board enforced without difficulty?

In most cases.

Suits brought by the Board:

No suits were brought.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria, scarlet fever and small-pox.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 2 cases, no deaths; typhoid fever, 3 cases, no deaths.

Is disinfection done under the direct supervision of Board?

Yes; the Board furnishes disinfectants where necessary.

Money spent by Board, including salaries:

Sixty-five dollars and six cents.

GRANVILLE—DR. JOHN WATKIN, H. O.

Population, 1,366.

Number and character of nuisances abated:

Quite a number, preventing pollution of the old wells of the town—the old water supply of the town—before introducing water-works.

Does the Board hold regular meetings?

One a month, regularly.

Are the orders of the Board enforced without difficulty?

They have been so far.

Suits brought by the Board?

No suits needed.

Are school children required to be vaccinated?

Not rigidly.

Are cases of typhoid fever reported to the Board?

Yes. An outbreak of typhoid fever in one house where a club of students boarded and nine contracted the disease. Source—pipe carrying waste water from kitchen and emptying into privy-vault. No trappings; return of gases and germs, probably into the kitchen, particularly when heated—distance of privy being somewhat less than thirty feet—the kitchen elevated some six feet above the ground, thereby favoring intercommunication.

What diseases do you placard?

We have had no occasion to placard at all last year.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 1 case, 1 death; typhoid fever, 9 cases, 1 death; measles, a few cases, no deaths; whooping cough, some cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No. Board does not furnish disinfectants. Our undertaker supplies it and uses it freely and judiciously.

Money spent by Board, including salaries:

Not over $25.00.

GREENVILLE—DR. G. W. BURNETT, H. O.

Population, 5,473.

Number and character of nuisances abated:

Thirty-eight hog-pens cleaned and purified; 13 cess-pools abated; 7 cellars condemned and cleaned; 9 dead animals buried; 248 loads manure, dirt and rubbish hauled out.

Does the Board hold regular meetings?

Yes. Monthly.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

One man arrested for maintaining a filthy hog-pen. He was fined the costs and they were remitted by the acting mayor.

Are school children required to be vaccinated?

Rules require it, but are not enforced.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard? Are cards removed by Board or attending physician?

Diphtheria and scarlet fever. Cards are removed by Sanitary Police when attending physician thinks danger is past.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 10 cases, 1 death; scarlet fever, 1 case, no deaths; whooping cough, 1 case, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

About $175.

GREENWICH—Dr. R. H Reynolds, H. O.

Population, 881.

Character and extent of improvements in sewerage:

There have been two sewers put in the past year about one-half mile in length.

Number and character of nuisances abated:

Had to cut off out-houses from one sewer; and had two slaughter-houses moved.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 7 cases, no deaths; typhoid fever, 8 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board including salaries:

None.

HAMLER—William Barhite, Sr., H. O.

Population, 556.

Number and character of nuisances abated:

1 privy, 1 dead horse, 2 hog-pens.

Does the Board hold regular meetings?

No. We are subject to the call of the mayor or health officer.

Are orders of Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Typhoid fever, diphtheria. By Board.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 18 cases, no deaths; whooping cough, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfectants are used in all buildings where sickness prevails recommended by the Board; furnished by occupants of buildings.

Money spent by Board, including salaries:

We have been organized only about six months. Have spent only fifty cents

HANGING ROCK—RANDOLPH GRAHAM, H. O.

Population, 816.

Number and character of nuisances abated:

Some dozen or more hog-pens; hogs turned out and pens covered with dirt and lime One alley cleaned of ashes and manure heaps and three cases of privy-vaults.

Does the Board hold regular meetings?

Have only held three regular meetings since organized.

Are the orders of the Board enforced without difficulty?

Have had difficulty with only one person and then served notice which was complied with.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

There has been no vaccination as yet.

Are cases of typhoid fever reported to the Board?

No cases reported.

What diseases do you placard?

Our Board ruled out placarding houses and procuring burial permits, but adopted all rules for local Board of Health but the above named.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 3 cases, no deaths; scarlet fever, 1 case, no death.

Is disinfection done under direct supervision of Board?

Disinfectants used by order of physician. Board has furnished nothing.

Money spent by Board during the year, including salaries:

No money spent nor salaries decided on as yet.

HICKSVILLE—S. BLODGET, H. O.

Population, 2,141.

Have water-works been introduced? If so, give source of supply:

We have water-works, fountain water, four eight-inch wells, sunk thirty-six feet, direct pressure from the wells; about nine months' test, giving the best of satisfaction.

Number and character of nuisances abated:

We have but little trouble, mostly privies and stables. Number of notices served, twenty.

Does the Board hold regular meetings?

Regular—first and third Thursdays of each month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Have not for about six years.

Are cases of typhoid fever reported to the Board?

Have not, but will be hereafter.

What diseases do you placard; are cards removed by the Board or by attending physician?

Small-pox, scarlet fever, diphtheria, typhus, typhoid fever, Asiatic cholera, yellow fever, whooping cough, measles. By Board

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 7 cases one death.

Is disinfection done under direct supervision of Board?

It is.

Money spent by Board, including salaries:

Thirty dollars.

HIGGINSPORT—DR. J. H. WILLIAMSON, H. O.

Population, 761.

Number and character of nuisances abated:

Two privies and two hog-pens.

Does the Board hold regular meetings?

Yes, monthly.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Have had no trouble in this, as the parents are anxious to have that attended to, and have it done at home at their own expense.

Are cases of typhoid fever reported to the Board?

Have not been heretofore but will be in the future.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, small pox Cards removed by the physician.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 3 cases, 1 death.

Is disinfection done under direct supervision of Board?

No, the attending physician attends to that.

Money spent by Board, including salaries:

None.

HILLIARDS—Dr. N. P. Davidson, H. O.

Population (estimated), 600.

Number and character of nuisances abated.

About half dozen privy-vaults renovated and two or three hog-pens removed.

Does the Board hold regular meetings?

No. I have made an effort to have regular meetings but we have had but one this year to reorganize.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board?

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No reports aside from what I have made.

What diseases do you placard; are cards removed by the Board or by attending physician?

So far we have placarded scarlet fever only, and cards are removed by order of attending physician or Health Officer.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria: Don't remember but 5 or 6; no deaths; typhoid fever, 6 cases, 2 deaths.

Is disinfection, after death or recovery, done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection, after death or recovery, is done under direct supervision of attending physician. Our Board does not furnish disinfectants.

Money spent by Board, including salaries:

None.

HUDSON—L. D. Osborne, H O

Population, 1,143.

Does the Board hold regular meetings?

The rule is monthly.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

All diseases named in this card. Cards removed by the Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, 1 death; scarlet fever, 6 cases, no deaths.

Is disinfection done under direct supervision of Board? Does the Board furnish disinfectants?

Supervision of Health Officer. Board furnish if necessary.

Money spent by Board, including salaries?

Bills have not all been settled; can not give the amount.

IRONTON—Dr. N. K. Moxley, Jr., H. O.

Population, 10,939.

Number and character of nuisances abated:

About 100; stagnant gutters, full vaults, hog-pens.

Does the Board hold regular meetings?

Stated meetings are for first Monday of each month Three or four meetings are generally held during the year.

Are the orders of the Board enforced without difficulty?

No.

Suits brought by the Board:

None have been brought.

Are school children required to be vaccinated? Is this requirement enforced?

Yes. No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician?

Small-pox, diphtheria and scarlet fever. Sometimes by one and sometimes by the other.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 9 cases, 3 deaths; scarlet fever, 56 cases, 4 deaths; typhoid fever, 8 deaths; measles, 111 cases, 9 deaths; whooping cough, 4 cases, 1 death.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Six hundred and sixteen dollars and sixty-six cents.

JACKSON—J. J. WILLIAMS, H. O.

Population, 4,320.

Number and character of nuisances abated:

Privies are the worst nuisances we have and have abated them to some extent.

Does the Board hold regular meetings?

No. Meetings are called by Health Officer when he thinks it necessary.

Are the orders of the Board enforced without difficulty?

Yes. We have but little trouble.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Since I have been Health Officer I have only placarded scarlet fever; in fact we have had no other infectious diseases.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, no deaths; scarlet fever, 50 cases, 2 deaths; typhoid fever, 6 cases, no deaths; whooping cough, 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

The Board spent nothing but my salary. I get $45 00 as policeman, and $5.00 extra as Health Officer.

KENT—J. F. CLARK, H. O.

Population, 3,501.

Number and character of nuisances abated:

None. Do not allow any nuisances to exist.

Does the Board hold regular meetings?

Yes, once a month.

Are the orders of the Board enforced without difficulty?

Yes, strictly.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

Yes, if any. None.

What diseases do you placard?

Typhoid fever, small-pox, whooping cough, diphtheria, scarlet fever, and all contagious diseases.

Money spent by your Board, including salaries:

Two hundred and fifty dollars.

LANCASTER—DR. J. W. LEWIS, H. O.

Population, 7,555.

Character and extent of improvements in sewerage:

About 2 miles; from 18 to 24-inch tile; from 7 to 20 feet deep; outlet Hocking River.

Number and character of nuisances abated:

Fifty-one hog-pens and ten slaughter-houses.

Does the Board hold regular meetings?

No, subject to call of Health Officer.

Are the orders of the Board enforced without difficulty?

No; the Council failed to respond.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

Not required.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria, scarlet fever, measles.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 20 cases, 4 deaths; scarlet fever, 12 cases, no deaths; typhoid fever, 10 cases, deaths not known; measles, 70 cases, deaths not known; whooping cough, not known.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection under direct supervision of Health Officer. Board of Health furnish material.

Money spent by Board, including salaries:

About $330.

LEESBURG—Dr. H. A. Beeson, H. O

Population, 617.

Character and extent of improvements in sewerage:

A great deal of new street work made in the last year, but is in such an unfinished condition that, although it includes some important waterways, the amount of sewerage can not be ascertained. The surface drainage is much improved.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

There exists no objection to vaccination among the citizens. They do not wait to be required to have children vaccinated. A requirement of this kind at one time developed the fact that all children had been vaccinated.

Are cases of typhoid fever reported to the Board?

Generally, but the rule is not as well observed as it should be.

What diseases do you placard?

Have had no occasion to placard any within the past year. Would placard small-pox, diphtheria, and in some cases scarlatina.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, no deaths.

Is disinfection done under direct supervision of Board?

It often has been done under direction or supervision of Health Officer Have been for a year or more almost absolutely free from contagious or infectious diseases. For one month past we have had the greatest epidemic of la grippe ever experienced; with this exception a most healthy year.

Money spent by Board, including salaries:

No salaries paid. A committee of village councilmen act as Board, and the Health Officer works for glory. The expense of cleaning up is paid by street fund; also a system of house cleaning at expense of property owner. No data of amounts.

LEETONIA—Dr. S. R. McCready, H. O.

Population, 2,826.

Number and character of nuisances abated:

About 35 or 40 privy-vaults have been cleaned out and disinfected. Besides this manure piles have been removed, hog-pens cleaned out, dead dogs and cats buried, stagnant water and cesspools drained off, alleys cleaned and slaughterhouses and surroundings cleaned.

Does the Board hold regular meetings?

Yes, monthly.

Are the orders of the Board enforced without difficulty?

We have had some difficulty in enforcing orders of Board but have not as yet found it necessary to bring suits against any parties.

Are school children required to be vaccinated?

No requirements in regard to vaccinating school children.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever and typhoid fever. Cards are removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 10 cases, no deaths; scarlet fever, 12 cases, no deaths; typhoid fever, 5 cases, no deaths; measles, 28 cases, 1 death.

Is disinfection done under direct supervision of Board?

No. Done under supervision of attending physician if at all. Board does not furnish disinfectants.

Money spent by Board, including salaries:

Three hundred and thirty-four dollars.

LIMA—DR. R. D. KAHLE, H. O.

Population, 15,981.

Character and extent of improvements in sewerage:

Six-foot stone sewer, 658 lineal feet; 5-foot stone sewer, 2306 lineal feet; 20-inch pipe sewer, 1,768 lineal feet; 18-inch pipe sewer, 854 lineal feet; 15-inch pipe sewer, 2,885 lineal feet; 12-inch pipe sewer, 11,260 lineal feet; total, 19,731 lineal feet.

Have water-works been introduced? If so, give source of supply.

Water-works have been introduced. The source of supply is Loss Creek, a small stream which is dry during the summer.

Number and character of nuisances abated:

A large number were abated; the exact number is not known.

Does the Board hold regular meetings?

The Board does not hold regular meetings, but meet at the call of the president.

Are the orders of the Board enforced without difficulty?

The orders of the Board are enforced without difficulty.

Suits brought by the Board:

No suits were brought by Board.

Are school children required to be vaccinated?

School children are required to be vaccinated but the requirement is not enforced.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard? Are cards removed by Board or by attending physician?

Measles, diphtheria, scarlet fever, typhoid fever and whooping cough. Cards are removed by Board or by attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 66 cases, 17 deaths; scarlet fever, 11 cases, no deaths; typhoid fever, 6 cases, 1 death; measles, 1 case, no death; I have no report of the number of cases before April 20, 1891. The above number of cases is since that time.

Is disinfection done under direct supervision of your Board: does the Board furnish disinfectants?

Disinfection is done under the direct supervision of the Board, and the disinfectants are furnished by the Board.

Money spent by Board, including salaries:

Sixteen hundred and seventy-nine dollars and seventy cents.

LOCKLAND—R. B. LATTA, H. O.

Population, 2,474.

Number and character of nuisances abated:

Fourteen privy-vaults cleaned 18 new vaults dug, 6 disinfected; hog-pens over 30, have been kept fairly clean. On and after January 1, 1892 hogs will not be allowed inside the corporation; ordered by the Board.

Does the Board hold regular meetings?

The Board has not met more than three times a year; no quorum.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No action by the Board.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Scarlet fever, diphtheria, measles, whooping cough, small-pox. Ordered removed by physician.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 3 cases, no deaths; typhoid fever, 8 cases, 1 death; measles, 7 cases, no deaths; whooping cough, 21 cases, 3 deaths.

Is disinfection done under direct supervision of Board?

Physician attends to it. Disinfectants not furnished by the Board.

Money spent by Board, including salaries:

One hundred and fifty-one dollars. We have a good supply of stationery.

LOGAN—Dr. I. C. Wright, H. O.

Population, 3,119

Number and character of nuisances abated:

Dead animals buried, 7; back yards, 3; hog-pens, 2; filthy alleys, 2; filthy old house, 1; overflowing privy-vault, 1; besides many other minor matters attended to by the Sanitary Police and remedied or abated by him without any notification by the Health Officer. The Sanitary Police was on duty as such half of the day and as assistant night police half of the night.

Does the Board hold regular meetings?

The regular meeting night is the second Friday night of each month, but meetings are not held regularly.

Are the orders of the Board enforced without difficulty?

Very generally; in one case on refusal to clean up back yard the same was done by Sanitary Police at owner's expense.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

They are not required to be vaccinated.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Small-pox, diphtheria, scarlet fever, measles and whooping cough. Cards are removed by the Board or by their orders.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 21 cases, no deaths; typhoid fever, 1 case, no death; measles, epidemic, no deaths; whooping cough, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

It is not, and disinfectants are not furnished by the Board.

Money spent by Board, including salaries:

Nothing, except for salaries of Health Officer, which is $100, and the Sanitary Police receives $1.25 per day for his services.

LORAIN—Dr. S. S. Cox, H. O.

Population, 4,863.

Number and character of nuisances abated:

We have records of fifty nuisances abated, consisting mo tly of privy-vaults, manure piles, stagnant water, etc.

Does the Board hold regular meetings?

Supposed to meet the second Tuesday in each month.

Are the orders of the Board enforced without difficulty?

Not very much trouble.

Suits brought by the Board:

One person arrested for tearing down a scarlet fever sign. Plead ignorance of the law and was discharged.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Scarlet fever and diphtheria Cards removed by the Board.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

One hundred dollars.

LOVELAND—Dr. J. B. Scott, H. O.

Population, 761.

Number and character of nuisances abated:

Twelve privy-vaults ordered cleaned, several pig-pens removed, dead animals buried, stagnant pond in corporation ordered drained.

Does the Board hold regular meetings?

Yes, once each month.

Are the orders of the Board enforced without difficulty?

As a rule, yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Not since my residence here.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Diphtheria.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, 2 deaths; typhoid fever, 4 cases, 2 deaths.

Is disinfection done under direct supervision of your Board?

Under direction of attending physician

Money spent by Board, including salaries:

About $10.

McCOMB—Dr. Jno. A. Thompson, H. O.

Population, 1,030.

Character and extent of improvements in sewerage.

About 6,000 feet of storm-water sewers laid this season; western half of village is now well provided.

Number and character of nuisances abated:

Privy-vaults, about 50; hog-pens 3.

Does the Board hold regular meetings?

No. Get together on call two or three times a year.

Are the orders of the Board enforced without difficulty?

No serious difficulty has been encountered.

Suits brought by the Board:

One for neglecting to comply with order to clean vault. Defendant, on intercession of complainant, was given thirty days to comply. Our mayor will enforce the order.

Are school children required to be vaccinated?

No. This community has very little protection against small-pox.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; and are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever and measles. By Health Officer.

Number of cases and deaths from infectious diseases, reported during the year:

No cases of either this year, except whooping cough

Is disinfection done under direct supervision of Board?

Health Officer directs it, and has in some cases furnished material.

Money spent by Board, including salaries:

About $55.

MADISON—Dr. A. H. Stockham, H O.

Population, 738.

Number and character of nuisances abated:

One cess-pool or pool of standing water drained.

Does the Board hold regular meetings?

No; it is not thought necessary.

Are the orders of the Board enforced without difficulty?

All requirements have been complied with.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Not directly.

MADISONVILLE—C. P. Gray, D D. S., H. O.

Population, 2,214.

Number and character of nuisances abated:

Hog-pens, privy-vaults, manure piles and garbage collections.

Does the Board hold regular meetings?

Regular; second Tuesday of every month.

Are the orders of the Board enforced without difficulty?

They are.

Suits brought by the Board:

One for partially burying a horse. The mayor let the party off with the costs of the case

Are school children required to be vaccinated?

We recommended it several years since to the schools.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or attending physician?

Cholera, small-pox, scarlatina and diphtheria. By the Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 1 case, no deaths; typhoid fever, not reported, 1 death; measles, 3 cases, no deaths, whooping cough, not reported, no deaths

Is disinfection done under direct super-

vision of Board; does the Board furnish disinfectants?

By the Health officer in malignant cases, and in every case request the physician to do so; if family is not able disinfectants are furnished by the Board.

Money spent by Board, including salaries:

One hundred and seventy-five dollars, including a new set of books and several hundred pamphlets of rules of the Board.

MANSFIELD—DR. R. HARVEY REED, H. O.

Population, 13,173.

Character and extent of improvements in sewerage:

A tile sewer on Bloom street of about one-half a mile in length, with arrangements to sewer the entire south hill with Warring's system next year.

Number and character of nuisances abated:

Eight hundred and sixty-seven. All kinds, from dead cats to water-closets, bad cellars and stagnant ponds

Does the Board hold regular meetings?

The Board meets just when necessary, at the call of the Health Officer or the President; last year they met six times.

Are the orders of the Board enforced without difficulty?

As a rule, although at times and under certain circumstances they require a suit.

If suits were brought by the Board, give character and results of trial in each case:

A suit was held for a nuisance caused by a manure heap from a livery stable, resulting in the abating of the nuisance. Since then no further suits have been necessary up to date of this report.

Are school children required to be vaccinated?

No, they are not required, but requested to be vaccinated, although I think they should all be compelled to be vaccinated.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard? Are cards removed by Board or by attending physician?

Diphtheria, scarlet fever and typhoid fever. We require small-pox, cholera, yellow fever, and typhus fever to be placarded should they occur. Both.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 69 cases, 11 deaths; scarlet fever, 37 cases, 3 deaths; typhoid fever, 18 cases, 4 deaths; typus fever, 1 case, no death; whooping cough—don't report measles or whooping cough.

Is disinfection done under direct supervision of your Board?

Yes.

Money spent by Board, including salaries:

Our Board spends, in round numbers, about $1,700 a year.

MARIETTA—DR C. W. EDDY, *Secretary.*

Population, 8,273.

Does the Board hold regular meetings?

No, only when called to consider some nuisance.

Are the orders of the Board enforced without difficulty?

We have but little trouble now.

Suits brought by Board:

None.

Are school children required to be vaccinated?

No, except when small-pox is prevalent near here.

Are cases of typhoid fever reported to the Board?

No, we have had but little of it here for several years.

What diseases do you placard?

Have placarded none.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Health Officer, $42.00; he is paid 20 cents per hour.

MARTIN'S FERRY—R. A. LINDEMUTH, H. O.

Population, 6,250.

Number and character of nuisances abated:

Have had 2 ponds filled, back of town. 70 odd out-houses cleaned. 12 new ones in place of old ones. 7 dry vaults in place of old ones.

Does the Board hold regular meetings?

They do not. It is hard to get a quorum.

Are orders of the Board enforced without difficulty?

Most generally.

If suits were brought by the Board, give character and results of trial in each case:

1. Emptying vault into alley (Water) plead guilty; fine, $3 00 and costs $8.00, were $11 00. 2. Refusing to empty vault, fined $1 00 and costs.

Are school children required to be vaccinated?

It is not required, but should be.

Are cases of typhoid fever reported to the Board?

They are not.

What diseases do you placard? Are cards removed by Board or by attending physician?

All the contagious diseases that I hear of, and also remove the card.

Number of cases and deaths from infectious diseases reported during the year:

I can make no report on this as so far it has not been a law to report sickness, births or deaths to the Health Officer.

Is disinfection done under direct supervision of Board? Does the Board furnish disinfectants?

They do not. I have paid for disinfectants myself on account of the kick in council about bills.

Money spent by your Board, including salaries:

Salaries, $134.50; printing, $7.00.

MECHANICSTOWN—DR. JOHN M. WATT, H. O.

Population (estimated), 312.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No Health Board.

Are school children required to be vaccinated?

No. This is a serious thing in villages and country districts; no attention is paid to vaccination whatever.

What diseases do you placard?

None

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 2 cases, no deaths; typhoid fever, 1 case, no deaths; measles, 1 case, no deaths; whooping cough, 40 cases, no deaths.

MEDINA—S. FRAZIER, H. O.

Population, 2,073.

Number and character of nuisances abated:

Nothing but cleaning slop drains and privies—75 in all.

Does the Board hold regular meetings?

Have had but three meetings since last spring.

Are the orders of the Board enforced without difficulty?

They are.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

They are not.

Are cases of typhoid fever reported to the Board?

They are not.

What diseases do you placard?

Diphtheria, scarlet fever, measles and whooping cough.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 9 cases, no deaths; typhoid fever, I can not tell, as they were not reported.

Is disinfection done under direct supervision of your Board?

No.

Money spent by Board, including salaries:

Not over $30.

MENTOR—DR. J. W. LOWE, H. O.

Population, 502.

Number and character of nuisances abated:

One slaughter house restricted; one dead horse properly buried; one stagnant whey pool at cheese factory removed; one water-closet changed location; one proper burial of butcher's offal.

Does the Board hold regular meetings?

Annually, with special meetings when necessary.

Are the orders of the Board enforced without difficulty?

Yes; we proceed in such a business-like manner that we never have any trouble.

Suits brought by Board:

No suits.

Are school children required to be vaccinated?

The question of vaccination has never been discussed by the Board on account of the absence of small-pox.

Are cases of typhoid fever reported to the Board?

Y s, when we have any, but it is a rare thing to find a case of typhoid in Mentor.

What diseases do you placard; are cards removed by Board or attending physician:

Diphtheria and scarlet fever, typhoid fever, whooping cough and measles if more than one case. Cards removed by Hea th Officer.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, no deaths; whooping cough, 2 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Health Officer attends to disinfecting at the expense of the family afflicted, and disinfectants are used both during and after recovery; also after death.

Money spent by your Board, including salaries:

The Health Officer receives $10 each year. No other money was spent by the Board this past year.

MIAMISBURG—Dr. W. S. Bookwalter, H. O.

Population, 2,952

Number and character of nuisances abated:

Abated 77; bad vaults, 48; hog-pens, 7; wells, 3; sinks, 5; manure piles, 7, and 7 more not mentioned.

Does the Board hold regular meetings?

Yes, once a month and as much oftener as circumstances may demand.

Are orders of the Board enforced without difficulty?

They are, with few exceptions.

Suits brought by Board:

As yet no suit has been brought.

Are school children required to be vaccinated?

They are required to be vaccinated but requirement has not been enforced.

Are cases of typhoid fever reported to the Board?

They are required to be and will be when existing.

What diseases do you placard?

Scarlet fever, small-pox, diphtheria, typhoid fever and measles.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, 1 death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No it is not, it is left to the attending physician and the family, who furnish their own disinfectants.

Money spent by your Board, including salaries:

One hundred and eighty-five dollars.

MIDDLETOWN—Dr. G. D. Lummis, H. O.

Population, 7,681.

Character and extent of improvements in sewerage:

Two new sanitary sewers constructed through principal portion of city.

Number and character of nuisances abated:

Sixty-one permits for new vaults, 50 permits to clean old vaults, 47 permits for burying dead animals, horses dogs and cattle.

Does the Board hold regular meetings?

Meetings subject to call of Health Officer.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

June 19, 1891, had J. K. arrested for removing scar et fever card, but owing to defect in city ordinance case dismissed with costs on Health Officer. The ordinances have been corrected.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or attending physician?

Scarlet fever, diphtheria and small-pox. Cards removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 15 cases, 5 deaths; scarlet fever, 55 cases, 1 death; typhoid fever, 3 cases, 3 deaths; measles, 1 case, no deaths; whooping cough, 1 death.

Is disinfection done under direct supervision of Board?

Disinfection ordered and directions given by the Board.

Money spent by Board, including salaries:

Four hundred and thirty-two dollars and seventy-five cents.

MIDWAY—Dr E. B. Meade, H. O.

Population (estimated), 300.

Number and character of nuisances abated:

Pig-pens.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

No; we have much trouble in having any orders enforced.

Suits brought by Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Not always.

What diseases do you placard?

Scarlet fever and diphtheria. Some people will not allow any card put up and if put up are torn down.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 1 case, no deaths; typhoid fever, 1 case, 1 death; whooping cough, 10 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

None.

MILLERSBURG—Dr. J. E Whitmar, H. O.

Population, 1,923.

Number and character of nuisances abated:

Privies, 6; hog-pens, 5; alleys and manure piles, 4; alleys and garbage, 3; phosphate in railroad yards.

Does the Board hold regular meetings; and how often?

No. At call of Health Officer.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

We do not placard.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, no deaths; scarlet fever, 2 cases, no deaths; typhoid fever, 4 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No. Disinfecting is generally attended to by the physician in charge, by order of Health Officer. Board does not furnish disinfectants unless in extreme cases

Money spent by Board, including salaries:

Seventy-five dollars, salaries.

MINERAL RIDGE—A. M. Beach, H. O.

Population, 851.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No regular meetings; meet at call of Chairman.

Are the orders of the Board enforced without difficulty:

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated:

This has not yet been enforced, but is pretty generally done.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

None as yet.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever 59 cases, 2 deaths; typhoid fever, 1 case, no deaths; measles, 6 cases, no deaths

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

I have given directions for disinfection. Board does not furnish disinfectants

Money spent by Board, including salaries:

None.

MINERVA—O. W. KURTZ, H. O.

Population, 1,139.

Number and character of nuisances abated:

We have had no nuisances to abate within last year.

Does the Board hold regular meetings?

Board has not held regular meeting for more than a year.

Are orders of the Board enforced without difficulty.

We have experienced no great difficulty thus far.

Suits brought by Board:

No suits have arisen from the execution of the laws governing duties of Board.

Are school children required to be vaccinated?

Our school children are not required to be vaccinated though most of them are vaccinated.

Are cases of typhoid fever reported to the Board?

Most all cases are known to Board.

What diseases do you placard?

We have had no cause for placards.

Number of cases and deaths from infectious diseases reported during the year:

No cases of any consequence.

Money spent by Board, including salaries:

None.

MINGO JUNCTION—JAS. BRETTELL, H. O.

Population, 2,408

Number and character of nuisances abated:

We have removed one slaughter-house, which was declared a nuisance, and abated the nuisance caused by two others; and one dwelling-house, and several minor cases, such as cleaning up yards, fixing privy-vaults, etc

Does the Board hold regular meetings?

Have only held meetings when deemed necessary.

Are orders of the Board enforced without difficulty?

Have not had much trouble to enforce orders only in one case, a slaughter-house, but the order was finally complied with.

Suits brought by the Board:

The Board has not brought any suits.

Are school children required to be vaccinated?

School children have not been required to be vaccinated.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Have had no diseases that were deemed necessary to placard.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, 1 death; scarlet fever, 10 cases, no deaths; typhoid fever 14 cases, no deaths; measles, 4 cases, no deaths.

Is disinfection done under direct supervision of your Board; does the Board furnish disinfectants?

Disinfection is under the supervision of the attending physician. The Board does not furnish disinfectants.

Money spent by Board, including salaries:

About $5.00 for printing small bills. Have paid no salaries.

MT OREB—J. A. CUMBERLAND, H O.

Population (estimated), 600.

Number and character of nuisances abated:

We have endeavored to make a general cleaning up in the way of pig-styes, privies, stables, etc.

Does the Board hold regular meetings?

We will aim to meet once a week—we have just re-organized.

Are the orders of the Board enforced without difficulty?

They have been so far.

Suits brought by the Board:

Have had no suits as yet.

Are school children required to be vaccinated?

Not yet.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Is disinfection done under direct supervision of Board?

No. Hope to be able to make a better report next time

Money spent by Board, including salaries:

None.

NAVARRE—PETER B. WELCH, H. O.

Population, 1,010.

Number and character of nuisances abated:

Fifteen cases, principally hog-pens and privy-vaults; 10 or more minor offenses, such as dead dogs, cats, chickens, offal, etc., not enumerated.

Does the Board hold regular meetings?

Regularly, the last Wednesday of each month.

Are the orders of the Board enforced without difficulty?

Pretty well.

Suits brought by the Board:

One case against the superintendent of our schools in not obeying a notification of quarantine against scarlet fever, he permitting scholars to enter school one week after said notification. Case tried and costs assessed.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

All diseases enumerated by the Board of Health (State Board) Cards are removed by Health Officer or by consulting physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 2 deaths; scarlet fever, 21 cases, no deaths; typhoid fever, 5 cases, no deaths; measles, 2 cases, no deaths.

Is disinfection done under direct supervision of Board?

Not yet

Money spent by Board, including salaries:

Fifty dollars.

NEW BREMEN—DR. M. S. EKERMEYER, H. O.

Population, 1,239.

Number and character of nuisances abated:

Quite a number of vaults ordered cleaned, butchers' offal removed; also hog pen.

Does the Board hold regular meetings?

Yes; last Friday of every other month

Are the orders of the Board enforced without difficulty?

Nearly all.

Suits brought by Board:

None.

Are school children required to be vaccinated?

Yes; all were vaccinated.

Are cases of typhoid fever reported to the Board?

Yes, but have not had any cases

What diseases do you placard; are cards removed by Board or attending physician?

Small-pox scarlet fever and diphtheria. Placards are removed and put up by our Sanitary Police.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 1 case, no deaths; whooping cough, quite a number, none fatal.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

None except salaries; amount to $32.

NEW HOLLAND—B. F. TANYREARY, H. O.

Population, 683.

Does the Board hold regular meetings?

Meetings are once a week, but do not always have a quorum.

Are the orders of the Board enforced without difficulty?

Pretty hard work on part of Health Officers.

Suits brought by the Board:

No suits to date.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Small-pox, scarlet fever and all contagious diseases.

Number of cases and deaths from infectious diseases reported during the year:

None.

Is disinfection done under direct supervision of Board? Does the Board furnish disinfectants?

Done by order of the Board. Board furnish if parties are too poor.

Money spent by Board, including salaries:

Do not know of any; I have not received any salary yet.

NEW MATAMORAS—Dr. W. L. West, H. O.

Population, 590.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No; special.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Number of cases and deaths from infectious diseases reported during the year:

None.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

None.

NEW LEXINGTON—Dr. J. H. Wright, H. O.

Population, 1 470.

Number and character of nuisances abated:

Fifty; pig-stys, privies, manure piles, contaminated wells, filth in yards and alleys.

Does the Board hold regular meetings?

Yes; once a month.

Are orders of the Board enforced without difficulty?

Yes; usually.

Suits brought by Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria and scarlatina. Attending physician, by order of the Board.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 50 cases, no deaths; typhoid fever, 26 cases, 3 deaths.

Is disinfection done under direct supervision of Board?

Yes.

Money spent by Board, including salaries:

Eighty dollars.

NEW LISBON—John Cavanagh, H. O.

Population, 2,278.

Number and character of nuisances abated:

Dead dogs buried, 7; dead cats buried, 6; hogs, 16; chickens, 5; manure, soap-suds, bone-piles, weed rubbish, 34; privy-vault contents removed, 21; buried 2 cows and 1 horse.

Does the Board hold regular meetings?

Do not hold regular meetings; had six meetings this last year.

Are the orders of the Board enforced without difficulty?

In some cases they are and some they are not.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes, and the houses placarded.

What diseases do you placard; are cards removed by the Board or by attending physician?

Scarlet fever, typhoid fever, measles, diphtheria, whooping cough. Cards generally removed by Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 11 cases, no deaths; typhoid fever, 2 cases, no deaths; measles, 7 cases, 1 death.

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

No.

Money spent by Board, including salaries:

One hundred and ninety-one dollars and fifty cents.

NEW LONDON—Dr. N. O Allen, H. O.

Population, 1,096.

Number and character of nuisances abated:

Sixty-two; such as neglected privies and hog-pens.

Does the Board hold regular meetings?

Yes, once a month.

Are the orders of the Board enforced without difficulty?

Yes, with but two exceptions.

Suits brought by the Board:

No suits were brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever and measles. The cards are removed by attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 4 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No; it is done under the supervision of the undertaker. The Board does not furnish disinfectants.

Money spent by Board, including salaries:

Seventy-five dollars.

NEW PARIS—Dr. I. S. Robinson, H. O.

Population, 842.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

Yes, once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Diphtheria, scarlet fever, measles, whooping cough, small-pox.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, 1 death; whooping cough, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes No.

Money spent by Board, including salaries:

Ten dollars.

NEW PHILADELPHIA—Dr. B. P. Scott, H. O.

Population, 4 456.

Number and character of nuisances abated.

No record is kept. The only nuisances found having been privy-vaults and cleaning up generally, which has been done on notice.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 3 cases, 2 deaths; typhoid fever, 5 cases, 2 deaths. The 2 cases of death from typhoid fever came here sick.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Not to exceed fifty dollars.

NEW STRAITSVILLE—BARNEY DAVIS, H. O.

Population, 2,782.

Number and character of nuisances abated:

Thirteen privy-vaults.

Does the Board hold regular meetings?

No. Once in a year.

Are the orders of the Board enforced without difficulty?

No.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Measles, scarlet fever, typhoid fever, diphtheria, whooping cough.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Salaries, Health Officer, $72 00. Have stopped that.

NEWTON FALLS—C. M. RICE, H. O.

Population, 698.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No. Very irregular: sometimes once a week, and sometimes not once a month.

Are the orders of the Board enforced without difficulty?

So far, yes.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Very seldom any here.

What diseases do you placard; are cards removed by Board or by attending physician?

Scarlet fever and diphtheria. Cards removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

This has not been decided as we are just getting into working order.

NEW WASHINGTON—J. F. KIMERLINE, H. O.

Population, 704

Number and character of nuisances abated:

Some fifteen out-houses ordered removed or put into healthy state at once; alleys cleaned of all nuisances, etc.

Does the Board hold regular meetings?

It does; second Monday evening, each month.

Are the orders of the Board enforced without difficulty?

As a rule they are.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever, smallpox, and all contagious diseases. Removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 4 cases, no deaths; typhoid fever, 5 cases no deaths; whooping cough, 10 cases, no deaths.

Is disinfection done under direct supervision of Board?

It is.

Does the Board furnish disinfectants?

It does not.

Money spent by Board, including salaries:

Not to exceed $20.

NORTH AMHERST—DR. N. H. CORNWELL H. O.

Population, 1,648.

Number and character of nuisances abated:

Caused three boarding houses to be thoroughly cleaned, and several privies to be cleaned.

Does the Board hold regular meetings?

Yes, three a year.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

They are not.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

All contagious diseases. Cards are removed by attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 22 cases, 2 deaths; typhoid fever, 18 cases, 1 death; measles, 1 death.

Money spent by Board including salaries:

Fifty-four dollars.

NORTH LEWISBURG—MICHAEL BROWN, H. O., PER DAVIS R. EMMONS, M. D

Population, 866.

Number and character of nuisances abated:

Two places where water formerly stood are now dry from effect of tile.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes, whenever orders are given.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

None

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria 4 cases, 1 death; typhoid fever, 8 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Five dollars.

NORWALK—M. SUYDAM, H. O

Population, 7,195.

Character and extent of improvements in sewerage:

Close to one mile of sewerage put down during current year; sewerage in good condition.

Number and character of nuisances abated:

Permits to clean privies, 233.

Does the Board hold regular meetings?

The regular meetings are held the first and third Mondays of each month

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

Yes

What diseases do you placard; are cards removed by the Board or by attending physician?

All contagious diseas. Removed by the attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria 2 cases, no deaths; scarlet fever, 6 cases no deaths; measles, 1 case, no death; whooping cough 1 case, no death

Is disinfection done under direct supervision of Board?

Yes.

Money spent by Board, including salaries:

Salary of Health Officer, $20 per month; Secretary of Board of Health, $50 per year.

OAK HARBOR—DR. J. M. STEWART, H. O.

Population, 1,681.

Number and character of nuisances abated:

Privy-vaults, rubbish accumulated in alleys. Number indefinite.

Does the Board hold regular meetings?

Semi-monthly.

Are orders of the Board enforced without difficulty?

Yes, save reports by physicians.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

When looked up by Health Officer.

What diseases do you placard?

All contagious diseases, viz: Diphtheria, scarlet fever, etc.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 12 cases, 2 deaths; whooping cough, 30 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes; Board does not furnish disinfectants.

Money spent by Board, including salaries:

Probably $150.

OBERLIN—THOS. R. MAYHEW, H. O.

Population, 4,376.

Number and character of nuisances abated:

Had none of a serious nature.

Does the Board hold regular meetings?

Not regular, but at call.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated? Is this requirement enforced?

They are; generally observed.

Are cases of typhoid fever reported to the Board?

They are

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever and small-pox. By both.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 12 cases, 2 deaths; scarlet fever, 8 cases, no deaths; typhoid fever, 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

It is.

Money spent by Board, including salaries:

Seventy-five dollars.

OHIO CITY—E. T. RUNNION, H. O.

Population, 606.

Number and character of nuisances abated:

One. Ditch cleaned out and rubbish removed.

Does the Board hold regular meetings?

Yes, monthly.

Are the orders of the Board enforced without difficulty?

Comparatively so.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

None to report.

What diseases do you placard?

Have not used any. Not necessary, as there were no diseases.

ORRVILLE—DR. H. BLANKENHORN, H. O.

Population, 1,765.

Number and character of nuisances abated:

Pig-pens and water closets the great bug-bear with us.

Does the Board hold regular meetings?

Not regular. Twice monthly in summer months.

Are the orders of the Board enforced without difficulty?

Not much trouble

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard? Are cards removed by Board or by attending physician?

Scarlatina, diphtheria. By physician.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 20 cases, no deaths; typhoid fever, 2 cases, no deaths; measles, 20 cases, no deaths; whooping cough, 12 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Can not conveniently tell at this time, but not much money expended.

OTTAWA—DR. C. E BEARDSLEY, H. O.

Population, 1,717.

Number and character of nuisances abated:

Fifty privy-vaults, 23 hog-pens, 3 slaughter-houses; dead animals and stable manure probably 100, all without litigation. The kitchen and other garbage is now daily removed without any trouble to the Health Officer.

Does the Board hold regular meetings?

They hold irregular meetings. The Board depends entirely upon the Health Officer, seconding his efforts only.

Are the orders of the Board enforced without difficulty?

In most instances without much trouble, but with persistent efforts of the Health Officer have succeeded without litigation

Suits brought by the Board:

There have been no suits brought this year.

Are school children required to be vaccinated?

This is not required by our School Board.

Are cases of typhoid fever reported to the Board?

I believe all have been but one.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, rubiola, variola. Typhoid fever has not as yet been placarded. The placard is generally removed by the Health Officer. In a few instances it has been torn down by some one else.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 4 cases, no deaths; typhoid fever, 13 cases, 2 deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Health Officer supervises the disinfecting of building, etc., after death, in most instances. The Board furnishes nothing, not even its presence.

Money spent by Board, including salaries:

Perhaps not to exceed three dollars. The salary of the Health Officer is seventy five dollars per year.

There should be a law passed to compel parties to construct soil tubs, which could be removed nightly, if necessary. Will give you my views soon.

PAINESVILLE—H. P. SANFORD, H. O.

Population, 4,755

Character and extent of improvements in sewerage:

About two miles of pipe-sewer constructed.

Number and character of nuisances abated:

One hundred and forty-three privy-vaults cleaned and 5 removed; 5 defective sewer-pipes repaired; 6 hog-pens abandoned; 3 dead animals removed; 4 manure piles removed; 6 cess-pools abandoned; 10 garbage piles removed.

Does the Board hold regular meetings?

Yes, third Tuesday, monthly

Are the orders of the Board enforced without difficulty?

Generally.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No, to Health Officer.

What diseases do you placard; are cards removed by Board or by attending physician?

All contagions and infectious diseases. By Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, 1 death; typhoid fever, 1 death.

Is disinfection done under direct supervision of Board?

No.

PAYNE—C. V. GORRELL, H. O.

Population, 1,146.

Number and character of nuisances abated:

None of magnitude, but through careful observations by members of Board the general hygienic conditions have been greatly improved.

Does the Board hold regular meetings?

Board expected to meet once a week, but not regular in their meetings.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None. Would small-pox, but have not had any cases.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 6 cases, no deaths; scarlet fever, 4 cases, no deaths; typhoid fever, 24 cases, 3 deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

First question no; second question no. Each physician furnishes medicines and disinfectants, and is lord of the situation.

Money spent by Board, including salaries:

Twenty dollars for salary only.

Town only eight years old, with but 1,200 inhabitants, unfledged in sanitary and all other matters.

PEMBERVILLE—E. B. MORSE, H. O.

Population, 843.

Number and character of nuisances abated:

About 7 hog-pens; one of them was at the mill, we declared it a nuisance and removed it.

Does the Board hold regular meetings?

We don't hold regular meetings, but we meet about three or four times a year by my call.

Are the orders of the Board enforced without difficulty?

Very little difficulty.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

It was done about two years ago but not since.

Are cases of typhoid fever reported to the Board?

They are not.

What diseases do you placard?

We have not placarded any this year.

Number of cases and deaths from infectious diseases, reported during the year:

Typhoid fever 4 cases, no deaths; whooping cough, 60 cases, no deaths.

Is disinfection done under direct supervision of Board?

It is not.

Money spent by Board, including salaries:

About $42.

PERRYSBURG—J. H. RHEINFRANK, H. O.

Population, 1,747.

Number and character of nuisances abated:

Privy-vaults cleaned in whole village and bad ones abated. All manure piles were ordered removed and premises cleaned generally.

Does the Board hold regular meetings?

Had no meetings this year.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

Vaccination is required but not enforced.

Are cases of typhoid fever reported to the Board?

The most were reported by physicians to Health Officer.

What diseases do you placard?

None placarded.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, about 10 cases, 1 death.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Thirty-five dollars in all for sanitary police.

PIONEER—WM. H DURBIN, H. O.

Population, 596.

Number and character of nuisances abated:

Four; two cess-pools and two slaughter-houses.

Does the Board hold regular meetings?

First Monday of each alternate month commencing with January and specials if necessary.

Are orders of Board enforced without difficulty?

They are.

Suits brought by the Board:

No suits been brought.

Are school children required to be vaccinated?

They are not.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard; are cards removed by the Board or by attending physician?

All that are contagious. Cards put up and removed by the Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, no deaths; scarlet fever, 2 cases no deaths; typhoid fever, 3 cases, 1 death; measles, 4 cases, no deaths; whooping cough, 6 cases, no deaths.

Is disinfection done under direct supervision of Board?

It is not.

Money spent by Board, including salaries:

No salaries allowed and no money spent.

PLYMOUTH—DR. R. D. SYKES H. O.

Population, 1,133.

Number and character of nuisances abated:

None. There have been none to abate

Does the Board hold regular meetings?

No. Meet as often as required.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated? Is this requirement enforced?

Yes. Yes

Are cases of typhoid fever reported to the Board?

No. The physicians make no reports to the Board of Health.

What diseases do you placard; are cards removed by the Board or by attending physician?

When there are any contagious diseases, they are placarded and quarantined. By order of Board.

Number of cases and deaths from infectious diseases, reported during the year:

Scarlet fever, 2 cases, no deaths; typhoid fever, 6 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

There are no salaries paid and no money was expended.

PORTSMOUTH—DR. JOS S. RARDIN, H. O.

Population, 12,394.

Character and extent of improvements in sewerage:

Three hundred and thirty feet in length, 3 feet in diameter; 332 feet in length, $2\frac{1}{2}$ feet in diameter; 321 feet in length, 2 feet in diameter; 240 feet in length, 1 foot sewer-pipe.

Number and character of nuisances abated:

New privy-vaults dug, 73; cow stable nuisances, 19; foul cisterns, 6; foul chicken-coops, 3; foul cellars, 16; foul garbage, 34; foul hog-pens, 14; two houses condemned and taken down.

Does the Board hold regular meetings?

Once each month on Monday before the first Wednesday.

Are the orders of the Board enforced without difficulty?

No. Many will delay to the last moment the execution of an order, while others are executed only by resort to law.

If suits were brought by the Board, give character and results of trial in each case:

Mrs. M arrested for maintaining a stagnant pool, found guilty and fined; nuisance committee have been instructed to abate same; John S. and Nick B. for burying cow in city, fined; Henry G. for maintaining manure nuisance, fined; Chris K. foul hog-pen, fined; Mrs. C. L. foul stable, fined.

Are school children required to be vaccinated?

They are required to be, but not enforced.

Are cases of typhoid fever reported to the Board?

A resolution was passed "requesting" physicians to report same—inoperative.

What diseases do you placard; are cards removed by the Board or by attending physician?

Scarlet fever, small-pox and diphtheria. By the Board.

Number of cases and deaths from infectious diseases reported during the year:

No record has been kept of number of cases of contagious diseases prior to May 1. Since May 1 there have been reported scarlet fever, 8 cases, diphtheria, 11 cases, up to Oct. 31, 1891. Diphtheria, 7 deaths; scarlet fever, 3 deaths; typhoid fever, 11 deaths; measles, 1 death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board superintends and oversees the disinfection in all cases. The Board furnishes disinfectants when owners can not buy them.

Money spent by Board:

Thirteen hundred and five dollars and eighty-eight cents.

PROSPECT—Dr. N. O. Brenizer, H. O.

Population, 830.

Number and character of nuisances abated:

Many privy-vaults and pig-stys.

Does the Board hold regular meetings?

Monthly.

Are the orders of the Board enforced without difficulty?

Not much difficulty.

Suits brought by Board:

None instituted.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes

What diseases do you placard?

Diphtheria, measles, scarlet fever.

Number of cases and deaths from infectious diseases reported from February 15, 1891:

Diphtheria, 3 cases no deaths; scarlet fever, 14 cases, 2 deaths; measles, 17 cases, no deaths; whooping cough, 6 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

About $30 for stationery and press work.

RAVENNA—Joseph Gledhill H. O.

Population 3,417.

Number and character of nuisances abated:

Can not state number. Character of nuisances are privies and slop drains The drains cause trouble because we have no system of sewerage.

Does the Board hold regular meetings?

Board meetings last Wednesday in each month.

Are the orders of the Board enforced without difficulty?

Not much difficulty.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No; have not since I have been on the Board.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever and measles. Cards are removed by the Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 11 cases, 3 deaths; scarlet fever, 9 cases, no deaths; typhoid fever, 3 cases, 1 death; measles, 2 cases, no deaths.

Is disinfection done under direct super-

vision of Board; does the Board furnish disinfectants?

Yes, sometimes furnish, if parties ask it; if not, they furnish.

Money spent by Board, including salaries:

About two hundred dollars.

READING—F. X. ANKENBAUER, H. O.

Population, 3,163.

Does the Board hold regular meetings?

Once every month.

Are the orders of the Board enforced without difficulty?

It causes a little trouble to get the parties to make their privy vaults properly; that is, to cement them; still we have th victory.

Suits brought by the Board?

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

By the Board.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 1 case, 1 death; typhoid fever, 1 case, no death; measles, 1 case, no death.

Is disinfection done under direct supervision of Board?

Yes; the doctor furnishes disinfectants.

Money spent by Board, including salaries:

One hundred dollars and fifty cents for salary.

RENDVILLE—DRS H. B. HACOMB, W. H. WOODWORTH, H. O.'s.

Population, 859.

Number and character of nuisances abated:

Nine pig-pens; 72 privy-vaults were cleaned and limed; 7 new vaults dug; 145 vaults were tapped.

Does the Board hold regular meetings?

Yes; our Board meets the fou th Thursday n month.

Are the orders of the Board enforced without difficulty?

Yes; we have no difficulty whatever.

Suits brought by Board:

We have had to bring no suits.

Are school children required to be vaccinated?

No, but that will be done very soon, or the next regular meeting of the Board.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or attending physician?

Diphtheria, scarlet fever, measles, typhoid fever. Cards removed by attending physician.

Number of cases and deaths from infections diseases reported during the year:

Diphtheria, 21 cases, no deaths; scarlet fever, 35 cases 5 de ths; typhoid fever, 2 cases, 1 death; measles, 45 cases, no deaths.

Money spent by Board, including salaries:

Two hundred and twenty-five dollars and forty-two cents.

RIPLEY—DR. GEO. P. TYLER, H. O.

Population, 2,483.

Number and character of nuisances abated?

None.

Does the Board hold regular meetings?

No Perhaps one meeting a year.

Are the orders of the Board enforced without difficulty?

When orders are made they are.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes, and enforced.

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever, measles, small-pox. The cards are removed by the attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, 1 death; typhoid fever, 4 cases, 2 deaths; whooping cough, 20 cases, no deaths.

Is disinfection done under direct supervision of Board?

By the Board.

Money spent by Board, including salaries:

Perhaps $200 per year.

RIVERSIDE—DR. FRANCIS KUSNICK, H. O.

Population, 2,169.

Number and character of nuisances abated?

Cincinnati office takes care of our milkmen, as a creek only divides the city from us.

Does the Board hold regular meetings?

No regular meeting. I do what is ordered either by mayor or by anybody interested.

Are the orders of the Board enforced without difficulty?

No

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Hard time to get the Cincinnati M. D.'s to comply with our request.

What diseases do you placard?

We had no chance to placard as most of our houses are far apart. The village is one-half mile wide and four miles long.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 5 cases, 1 death; scarlet fever, 8 cases, death; typhoid fever, 3 cases, no deaths; measles, 28 cases, no deaths; whooping cough, 1 case, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

The Board leaves that entirely to me. If the expense is small I pay it out of my pocket, and in case of large outlay I get pay with my salary.

Money spent by Board, including salaries:

My salary is $300; for removing garbage, $20 per month; to the very poor, drugs, food, etc., I am at liberty to furnish.

ROCKY RIDGE—JOHN H BENSE, *Mayor.*

C. O. PROBST, M. D., *Sec'y of State Board of Health:*

DEAR SIR: The inclosed came to hand to-day. In reply will say that our village has abandoned the Board of Health of said village because we could not get any persons to serve on same. We also have no Health Officer, and as there have been no reports made can not give desired information.

SABINA—DR. A. J. GASKINS, H. O.

Population, 1,080.

Number and character of nuisances abated:

There have been eighty-five notices issued for the abatement of nuisances, such as privy-vaults, hog-pens, weeds, filth about stables etc., and the most, or in fact, all have been complied with.

Does the Board hold regular meetings?

Yes; every two weeks through the winter season and every week through summer.

Are the orders of the Board enforced without difficulty?

They have been so far.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria, scarlet fever, whooping cough and measles.

Number of cases and deaths from infectious diseases reported during the year:

Scarlet fever, 2 cases, no deaths; typhoid fever, 1 case, 1 death

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

One hundred and fifteen dollars, or thereabouts.

SANDUSKY—DR. ELWOOD STANLEY, H. O.

Population, 18,471.

Character and extent of improvements in sewerage:

There were completed during the past year about 3 miles of main and lateral sewers, 82 catch-basins, 93 permits to connect with main

sewer for private houses. There was expended on the work about $68,000.

Number and character of nuisances abated:

Fifty-two cellars cleaned and repaired; 41 lateral sewers to dwellings and business houses cleaned and put in good order; 22 alleys cleaned and put in good sanitary condition.

Does the Board hold regular meetings?

Regularly every two weeks.

Are the orders of the Board enforced without difficulty?

The last year they have been enforced without legal process and but little trouble.

Suits brought by the Board:

None the last year.

Are school children required to be vaccinated?

They have not been since the Board was organized two years ago

Are cases of typhoid fever reported to the Board?

They are.

What diseases do you placard; are cards removed by the Board or by attending physician?

Small-pox, diphtheria, scarlet fever and typhoid fever. Cards are removed by order of Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, 2 deaths; scarlet fever, 7 cases, no deaths; typhoid fever 6 cases, 2 deaths; measles, 1 case, no death; whooping cough, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Under direct order of the Board. Board furnishes disinfectants for poor people only.

Money spent by Board, including salaries:

One thousand two hundred and ninety-nine dollars and forty-nine cents.

ST BERNARD—Dr. R. H. Whallon, H. O.

Population, 1 779.

Number and character of nuisances abated:

About 25 privy-vaults; all hog-pens; about 20 to 25 garbage nuisances.

Does the Board hold regular meetings?

The last Wednesday of each month; quite often no quorum.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

Two suits brought by Health Officer during the year. First, for burying horse in the corporation. Second, against a Cincinnati, Ohio firm for emptying water from a vault on a side street. Both successful.

Are school children required to be vaccinated?

It is not enforced.

Are cases of typhoid fever reported to the Board?

No. Do you think it necessary? They do not require it in Cincinnati, Ohio. We copy after them, being next door to them.

What diseases do you placard?

Do not placard any—could not do it, as every other house is a saloon, and a royal kick would be made.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 30 cases, 3 deaths; scarlet fever, 20 cases, 2 deaths; typhoid fever, cases not reported, 4 death; measles, 35 cases, 2 deaths; whooping cough, not reported.

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

No.

Money spent by Board, including salaries:

Health Officer	$150
Sanitary Officer	120
Clerk	50
Total	$320

SAINT PARIS—C. A. Offenbacher, H. O.

Population, 1,145.

Number and character of nuisances abated:

Twelve privies cleaned; hog-pens abated.

Five saloons abated by local option vote, not by Board of Health.

Does the Board hold regular meetings?

Provision for monthly, but have not met since last May.

Are the orders of the Board enforced without difficulty?

Yes, generally.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No. None vaccinated here in the last ten years

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Meas'es scarlet fever and diphtheria.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 2 deaths; scarlet fever. 6 cases, no deaths; typhoid fever, 1 case, no deaths.

Is disinfection done under direct supervision of Board?

No. Have been leaving that to the physician in charge.

Money spent by Board, including salaries:

Fifteen dollars. We have had no sickne s here this last year and our Board has grown dormant.

SALINEVILLE—James Carter, H. O.

Population, 2,369.

Number and character of nuisances abated:

Privy-vaults, hog-stys, stables, etc.

Does the Board hold regular meetings?

Yes. once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Not strictly.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

All infectious disea-es.

Number of cases and deaths from infections diseases reported during the year:

Whooping cough, 3 cases, no deaths.

Money spent by Board, including salaries:

About $20.

SALEM—Dr. T. T. Church, H. O.

Population, 5,780.

Number and character of nuisances abated:

One hundred and ninety-one written notices to abate nuisances were issu'd. Besides these many nuisances were abated by personal request. The cleaning of cellars, wells, back yards, alleys, privies and cess-pools; the making and repairing of drains, and the removing of pigs outside the corporation was the general character of the work done.

Does the Board hold regular meetings?

During the spri g and early summ r, once in two weeks; at other seasons, at the call of the Health Officer.

Are the orders of the Board enforced without difficulty?

Occasionally we encounter some obstinate individual, but the orders are usually enforced.

If suits were brought by the Board, give character and results of trial in each case:

One man was prosecuted f r keeping a pig in the city without a permit and was fined one dollar and costs. He killed the pig the next day.

Are scho l children required to be vaccinated?

No; they are not required to be vaccinated.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria and scarlet fever. The cards are removed by the Health Officer.

Number of cases and deaths from infectious disea es reported during the year:

Diphtheria. 46 cases, 7 deaths; scarlet fever. 58 cases, no deaths; typho d fever. 68 cases, 8 deaths; measles, 5 cases, no deaths; whooping cough, 1 case no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection is not done under direct supervision of the Board. but disinfectants are furnished by the Board in all cas s when the people themselves are unable to procure them.

Money spent by Board, including salaries?

About $400.

SCOTT—Dr. C. W. Gordon, H. O.

Population, 733.

Number and character of nuisances abated:

A number of privies and stables.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

SHAWNEE—CHARLES E. WHITTINGTON, H. O.

Population, 3,266.

Number and character of nuisances abated:

Forty-three full privy-vaults, 7 filthy hog-pens 3 filthy corners at saloons, 2 hog-wallows on street 3 manure piles on alleyways, 2 stables from wells, 7 buried hogs, 3 buried horses, 2 buried cows, 2 open vaults, 1 leaky vault, 1 vault on stream of water.

Does the Board hold regular meetings?

Our meetings should be once a month; but we have met four times since October, 1890.

Are the orders of the Board enforced without difficulty?

Yes. Except the large corporations; they hold us back as long as possible.

Suits brought by Board:

None.

Are school children required to be vaccinated?

Not enforced.

Are cases of typhoid fever reported to the Board?

No. I have to go myself to the doctor's. No record kept.

What diseases do you placard?

None.

Is disinfection done under direct supervision of Board?

None is done.

Money spent by Board, including salaries:

Sanitary Officer, $16.00; clerk, $24.00. Money paid by the council.

SHELBY—DR M. T. LOVE, H. O.

Population 1,977.

Number and character of nuisances abated:

Numerous. Privy-vaults, wells cleaned, etc.

Does the Board hold regular meetings?

No. Meet as necessary.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board?

No suits were brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes, in some instances. Some are careless.

What diseases do you placard; and are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever. By Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 1 death; scarlet fever, 10 cases, no deaths; typhoid fever 12 cases, 1 death; whooping cough, 1 case, no death.

Is disinfection done under direct supervision of Board? Does the Board furnish disinfectants?

Yes. Yes, we furnish it.

Money spent by Board, including salaries:

Not more than twenty dollars

SHERODSVILLE—JNO. EBDIN, H. O.

Population, 893.

Number and character of nuisances abated:

Five privies, five hog-pens.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No.

Are case of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

None.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, no death.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Twenty-five dollars for abating nuisance—salaries nothing.

SIDNEY—Dr. Edwin Lefevre, H. O.

Population, 4,850.

Number and character of nuisances abated:

Can not give number—mainly filthy privy-vaults.

Does the Board hold regular meetings?

Yes; twice a month in the summer, and once a month during the winter.

Are the orders of the Board enforced without difficulty?

As a rule they are, but have had trouble in a few cases.

If suits were brought by the Board, give character and results of trial in each case:

In the cases we have had the results have not been favorable to us. We have little faith in the average jury when sanitary matters are at issue.

Are school children required to be vaccinated?

Yes, but the rule is not strictly enforced.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Small-pox, diphtheria, scarlet fever, measles, whooping cough and malignent cases of typhoid fever.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria 3 cases, 1 death; scarlet fever, 9 cases, no deaths; typhoid fever, 12 cases, no deaths; messles, 75 cases no deaths; whooping cough, 6 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes. We have never yet furnished any disinfectants but have given instructions as to how it should be done.

Money spent by Board, including salaries:

About two hundred dollars.

SMITHVILLE—Jos. W. Bricker, H. O.

Population, 482.

Number and character of nuisances abated:

None the past year.

Does the Board hold regular meetings?

No meetings for a year.

Are the orders of the Board enforced without difficulty?

Some difficulty.

Suits brought by Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

All infectious and contagious diseases. By order of physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 1 case, no death.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries?

Nothing.

SOUTH CHARLESTON—Dr. M. E. Ramsey, H. O.

Population, 1,041.

Character and extent of improvements in sewerage:

Almost one thousand rods of sewer-pipe have been laid; old sewers inspected and the whole sewerage system is good.

Number and character of nuisances abated:

Ninety-one vaults, hog-pens, slaughter-houses and stables.

Does the Board hold regular meetings?

No. Only on call of Health Officer.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

Have had no suits.

Are school children required to be vaccinated?

They are not required to be vaccinated.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or attending physician?

Measles, scarlet fever and diphtheria Card removed by Health Officer or Sanitary Marshal under his directions.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; measles, 220 cases, 1 death.

Is disinfection done under direct supervision of Board?

We have allowed the occupants to disinfect under direction of Health Officer.

Money spent by Board, including salaries:

About $75.

SPRINGBORO—DAVID MERING, H. O.

Population, 413.

Number and character of nuisances abated:

I canvass the town twice a year and require cellars, privies, pump-drains of waste-water and manure pens to be kept in a clean and orderly condition.

Does the Board hold regular meetings?

It does not. I have to call meetings when I need their action.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

We never had to sue except once, then the party obeyed speedily.

Are school children required to be vaccinated? Is this requirement enforced?

Yes, to both.

Are cases of typhoid fever reported to the Board?

There are no cases. They will be reported if they occur.

What diseases do you placard:

It has not been necessary to placard.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 1 case, 1 death.

Is disinfection done under direct supervision of Board?

The above case was reported typhoid fever, but it was malarial fever, and the house was cleaned up and not occupied for six months

Money spent by Board, including salaries:

No expenditures, except my pay which will be about fifteen dollars.

SPRING VALLEY—DR S. E. DYKE, H. O.

Population, 538.

Number and character of nuisances abated:

There have been several hog-pens and several other minor nuisances abated.

Does the Board hold regular meetings?

Only as the Board has reports requiring their action.

Are the orders of the Board enforced without difficulty?

In the main, yes.

Suits brought by the Board:

There have been no suits.

Are school children required to be vaccinated?

There has been no order issued requiring vaccination. None enforced.

Are cases of typhoid fever reported to the Board?

Yes, when prevalent.

What diseases do you placard; are cards removed by Board or by attending physician?

All infectious diseases. Cards removed by order of the Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 8 cases, 1 death; scarlet fever, 2 cases, 1 death; measles 1 case, no deaths; whooping cough, 1 case no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Disinfection is done by the order of the Board and under their supervision. Yes, the Board furnishes disinfectants

Money spent by Board:

Do not know, I think about $50. There are no salaries. My recompense is the glory there is in being Health Officer.

STEUBENVILLE—DR. A. A. ELLIOTT.

Population, 13,394.

Number and character of nuisances abated:

No record kept.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits brought.

Are school children required to be vaccinated?

Yes. By Board of Education.

Are cases of typhoid fever reported to the Board?

No reports of contagious diseases required.

What diseases do you placard?

There is no rule regarding this except ordinance of council which placards small-pox.

Number of cases and deaths from infectious diseases, reported during the year:

Have no means of knowing, as no record is kept.

Is disinfection done under direct supervision of Board?

Nothing of the kind has been attempted.

Money spent by Board during the year, including salaries:

A sanitary policeman was employed for six weeks at $2.50 per day.

I am not a member of the Board of Health nor city Health Officer, no such office being in existence in Steubenville.

SUNBURY—DR. J. H. GERHARDT, H. O.

Population, 475.

Number and character of nuisances abated:

Not any during the last year

Does the Board hold regular meetings?

No. The Mayor has not filled the vacancy caused by expiration of term of office.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Our rules require that malignant cholera, yellow fever, small-pox, typhus fever, diphtheria measles, cerebro-spinal fever, puerperal fever be placarded.

Number of cases and deaths from infectious diseases reported during the year

Scarlet fever 1 case, no death; whooping cough, 2 cases, no deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Not any.

TIFFIN—DR. J. BRIDINGER, H. O.

Population, 10,801.

Number and character of nuisances abated:

About one thousand, principally hog-pens and privy-vaults. Hogs are almost entirely excluded and prevented from being kept in corporation. Privies must all be conducted into sewers with flushing system.

Does the Board hold regular meetings?

Yes; in November, December, January and February, 1st Wednesday; in March, April, May, September and October, 1st and 3d Wednesdays; in June, July and August every Wednesday.

Are the orders of the Board enforced without difficulty?

No difficulty now.

Suits brought by Board:

None.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

They have not as yet. Some few have lately been reported.

What diseases do you placard; and are cards removed by the Board or by attending physician?

Diphtheria and scarlet fever are placarded within six hours after notification by physician in attendance. Cards removed by sanitary police.

Number of cases and deaths from infectious diseases reported during the year

Diphtheria, 107 cases, 17 deaths; scarlet fever, 11 cases, no deaths.

Is disinfection done under direct supervision of your Board; does the Board furnish disinfectants?

Disinfection is done immediately after death or recovery by the sanitary police under super

vision of Health Officer. Board furnishes disinfectants.

Money spent by Board, including salaries:

Health Officer, $480; Clerk, $120; Sanitary Police, $376.25; other services, $95.32; Total $1,071 57.

The Board of Health has passed a resolution to prevent hogs being kept within 150 feet of any dwelling or public building, which virtually prohibits the keeping of hogs in the city. The Board also passed resolution regulating slaughter-houses, preventing carrying on the business within 1,000 feet of any dwelling or public building, which of necessity places them outside the city. So Tiffin will be soon a model city for cleanliness and the health and welfare of its citizens.

TOLEDO—DR. ALBERT W. FISHER, H. O.

Population, 81,434.

Number and character of nuisances abated:

Alleys, 651; cellars filthy, 86; dead animals removed, 1,093; defective drainage, 132; drain-pipes leaking 27; gutters, filthy, 399; gutters obstructed, 206; garbage in alleys, streets and lots, 2728; houses, filthy, 54; houses damp, 23; houses infected, 378; hog-pens, filthy, 157; infected bedding destroyed 20; manure heaps, 619; cisterns, foul, 91; ponds of water, 60; privies, dangerous 83; privies, filthy, 275; catch-basins, 210; privy-wells, full, 2345; privy-wells, leaking, 15; yards, filthy, 149; privy-wells, foul, 361; treets, filthy, 120; wells, foul, 47; stables, filthy, 162; sewers obstructed, 32; vacant lots, filthy, 150; water in cellars, 78.

Does the Board hold regular meetings?

Yes, twice a month.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

Number of suits, character and results of trial in each case, from November 1, 1890, to October 31, 1891:

Two arrests for dumping paper in alley; discharged, abated. One for covering up a privy-vault; discharged, abated. One for defacing an out-house; discharged, abated.

Three arrests for violating health ordinance; found guilty fined	$42 60
Two arrests for throwing rubbish and other matter in alley; found guilty, fined	3 20
One arrest for emptying privy-vault without permit; found guilty, fined	8 20
Total	$54 00

Total arrests, 10. Three were discharged by the court and nuisances abated.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or attending physician?

Small-pox, scarlet fever, diphtheria. Cards removed by orders of the Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 293 cases 97 deaths; scarlet fever, 60 cases, 2 deaths; typhoid fever, cases not reported, 19 deaths; measles, cases not reported, 2 deaths; whooping cough, cases not reported, 7 deaths

Is disinfection done under direct supervision of Board?

Yes.

Does the Board furnish disinfectants?

Yes.

Money spent by Board, including salaries:

Garbage, $10,500; Health Officer, $1200; Meat and Milk Inspector, $1200; Sergeant Sanitary Police, $9.00; eight Sanitary Police, $300 each; six city physicians, $350 each; city chemist, $500 per year.

TROY—DR. J. G. SENOUR, H. O.

Population, 4,494.

Number and character of nuisances abated:

Hog-pens, privies, etc.

Does the Board hold regular meetings?

No only by call.

Are the orders of the Board enforced without difficulty?

Very well enforced.

If suits were brought by the Board, give character and results of trial in each case:

Suit against Infirmary Directors to permit running filth, etc., into the Miami River and was defeated by a letter or affidavit from a member of the State Board. The sewer is only one fourth mile above town, when it is emptied into river and then flows through or to one side of town

Are school children required to be vaccinated?

Yes, during an epidemic.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria, scarlet fever, small-pox.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 20 cases, 5 deaths; scarlet fever, 6 cases, no deaths. (This is only from personal knowledge). Typhoid fever, 12 cases 3 deaths; measles, 8 cases, no deaths; whooping cough, 5 cases, no deaths.

Is disinfection done under direct supervision of Board?

Yes.

Money spent by Board, including salaries:

Can not say, as all bills are paid by order of Council—no salaries to members of Board.

UHRICHSVILLE—Dr. J. E. Groves, H. O.

Population, 3,842.

Character and extent of improvements in sewerage:

Sewers have been put in on three streets. Two more streets are under contract.

Number and character of nuisances abated:

Three privies and two pig-pens.

Does the Board hold regular meetings?

Never meets.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Not one cent.

The answers to your circular will show you the deplorable condition of the Board of Health in this town. I do not think there has been any call for a meeting of the Board in two years. Our Mayor, and President of the Board, is a fossil that should be in an archæological museum somewhere. He opposes every improvement in the town, and a Board of Health, of which he is the head, takes no interest in sanitary matters whatever. All the work done in investigating nuisances, reported to me, is done by the City Marshal. I asked the council to appoint him sanitary policeman, and after repeatedly bringing up the matter, and the Mayor putting the matter off by promising to appoint a new Board of Health, the council finally, at a meeting at which he was not present, passed a resolution appointing the Marshal Sanitary Policeman. He has attended to all matters brought to his attention very well. There are no reports made to the Board. All the matters which I have reported in the past have been obtained by personal effort and, of course, have never been full. I wrote you of this matter once before. I have been hoping for better things. I hope and believe that next spring will bring us a change in Mayor, and I hope better our condition.

Very truly yours,

J. E. Groves.

UNION CITY—Dr. Wm. M. Grimes, H. O.

Population, 1,293.

Character and extent of improvements in sewerage:

One thousand feet of 24-inch sewer-pipe.

Have water-works been introduced?

The council passed an ordinance to put in water-works and appointed trustees to find water sufficient to supply our village; said trustees found water which they thought sufficient for all purposes. About this time the State line survey was commenced and nothing further has been done. If the towns are made one the water-works now in Union City, Indiana, can supply all.

Number and character of nuisances abated:

Thirty-one; 27 privies cleaned; 2 hog-pens cleaned and disinfected; stagnant water, 15 covering an open well, 1.

Does the Board hold regular meetings?

The Board has failed to meet regularly.

Are the orders of the Board enforced without difficulty?

There has been but very little difficulty in enforcing their orders.

Suits brought by the Board:

No suits this year.

Are school children required to be vaccinated?

There has been no small-pox scare this year and nothing said about it.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Small-pox, diphtheria, scarlet fever, whooping cough, measles and typhoid fever. Placards are removed by the Health Officer

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, no deaths; typhoid fever, 17 cases 1 death; measles, 4 cases, no deaths.

Is disinfection done under direct supervision of Board?

I order the disinfecting and also give the pamphlet of instructions on disinfectants that you sent me.

Does the Board furnish disinfectants?

The Board does not furnish disinfectants.

Money spent by Board, including salaries:

I think about $80.

UPPER SANDUSKY—Dr. O. C. Stutz, H O.

Population, 3572.

Character and extent of improvements in sewerage:

One 18-inch sewer; about 500 feet.

Number and character of nuisances abated:

Cleaning of hog-pens and privy-vaults, removal of garbage and other filthy matter, all dead animals buried; in all, about 160 nuisances abated.

Does the Board hold regular meetings?

Meet but three or four times a year. They should meet once a month.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

Suit brought against a Mr. M. for selling diseased cattle. Grand jury found no indictment. The butcher who sold the meat was fined $25, which was paid.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard? Are cards removed by Board or by attending physician?

Small-pox, scarlet fever and diphtheria. Cards removed by Health Officer if he is notified.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 10 cases, 4 deaths; scarlet fever, 3 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes The Board furnishes disinfectants.

Money spent by Board, including salaries:

About $125.00.

URBANA—Dr. H. C. Houston, H O.

Population, 6,510.

Character and extent of improvements in sewerage:

None.

Number and character of nuisances abated:

Ninety-five orders for new privy-vaults, 115 orders to cleanse hog-pens, 12 orders to clean barn yards, 3 orders to cleanse residence, 2 orders to fill cess-pools, 2 orders to deodorize warehouses having fertilizers for sale.

Does the Board hold regular meetings?

First Tuesday of each month.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

Yes

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Scarlet fever, diphtheria and small-pox. Cards removed by sanitary policeman or property holder on order from Health Officer.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 1 case, no death; scarlet fever, 45 cases, 4 deaths; typhoid fever, 5 cases, 2 deaths; measles, 16 cases, no deaths; whooping cough, 24 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Three hundred dollars.

UTICA—H. C. DICUS, H. O.

Population, 763.

Number and character of nuisances abated:

None.

Does the Board hold regular meetings?

No. We are now trying to arrange regular meetings and get down to sanitary work, but success is doubtful.

Are the orders of the Board enforced without difficulty?

No.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Have not been hitherto.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria and scarlet fever, and cards removed by attending physician.

Is disinfection done under direct supervision of Board?

No. Done very imperfectly by order and instruction of attending physician.

Money spent by Board, including salaries:

None.

VAN WERT—DR. E. L. WILKINSON, H. O.

Population, 5,512.

Have water-works been introduced? If so, give source of supply.

Yes; supply comes from wells sunk into second vein in rock, about eighty-five feet deep. Water will be turned on December 25, 1891.

Number and character of nuisances abated:

Have not kept a record of them.

Does the Board hold regular meetings?

No; only called meetings.

Are orders of the Board enforced without difficulty?

No.

If suits were brought by the Board, give character and results of trial in each case:

Brought suit under rules where a person was proved guilty of continuously and maliciously throwing wash water wherein diapers had been washed, in a sink-hole within eleven feet of neighbor's well, and Mayor found "not guilty," because we did not demonstrate water in well was poisoned.

Are school children required to be vaccinated?

Yes.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Diphtheria scarlet fever, small-pox, measles and cholera.

Number of cases and deaths from infectious diseases, reported during the year:

(Deaths are not reported) Diphtheria, 17 cases, 2 deaths; scarlet fever, 3 cases; typhoid fever, not reported; measles, 1 case; whooping cough, not reported.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

No; Board does not furnish disinfectants.

Money spent by Board, including salaries:

About $225

WADSWORTH—DR. C. N. LYMAN, H. O.

Population, 1,574.

Number and character of nuisances abated:

A few hog-pens and filthy drains.

Does the Board hold regular meetings?

No; meet at the call of the Mayor.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

Not any suits brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

None.

WATERVILLE—DR. SAMUEL DOWNS H. O.

Population, 586.

Number and character of nuisances abated:

Since our Board was organized they have abated five nuisances one slaughter-house and four privies.

Does the Board hold regular meetings?

The Board meets the first Saturday of every month, but has only held three meetings since its organization.

Are the orders of the Board enforced without difficulty?

Orders issued have been complied with, and without difficulty.

Suits brought by the Board:

We have had no suits.

Are school children required to be vaccinated?

The Health Board has taken no action on vaccination.

Are cases of typhoid fever reported to the Board?

There have been no cases reported at this office since organized.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever and small-pox. The attending physician removes the card

Number of cases and deaths from infectious diseases reported during the year:

None.

Is disinfection done under direct supervision of your Board?

We have taken no action in this matter; but proper disinfectants will be used during and after each case, whether recovery or death takes place.

Money spent by Board, including salaries:

Our officers are generous fellows, their work is all gratis.

WAPAKONETA—JNO. R. MOUCH, H. O.

Population, 3,616.

Number and character of nuisances abated:

Twenty-six; character, was overflowing privy-vaults and filthy hog pens.

Does the Board hold regular meetings?

The Board has met six times in the last year.

Are the orders of the Board enforced without difficulty?

Yes

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

None

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 23 deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Health Officer and Sanitary Police, salaries and fees, $55 35.

WASHINGTON C. H.—J. M. EDWARDS, H. O.

Population, 5,712.

Number and character of nuisances abated:

Fifty filthy privies, 3 slaughter-houses, 1 fertilizing establishment, 25 hog pens. Our council have now passed an ordinance abolishing hog-pens in city and a few minor nuisances.

Does the Board hold regular meetings?

No. Meet on call of President

Are the orders of the Board enforced without difficulty?

Yes generally complied with at once.

If suits were brought by the Board, give character and results of trial in each case:

One arrest for putting offal in street, dismissed with costs; three for keeping hog-pens, same.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard?

Typhoid fever, scarlet fever and measles are all we have had.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases no deaths; scarlet fever, 2 cases, no deaths; typhoid fever, 2 cases, 1 death; measles, 22 cases, 2 deaths.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Health Officer, $100; printing, $3; burying dogs, $2.

Our water-works company are putting in artesian wells 200 feet and getting good water and abundance of it.

WASHINGTONVILLE—Dr. O. A. Rhodes, H. O.

Population (estimated), 1,300.

Number and character of nuisances abated:

Burying in corporate limits of man or animal prohibited.

Does the Board hold regular meetings?

No Board abolished by town council after a severe quarrel.

Are school children required to be vaccinated?

Is advocated by physicians and Superintendent of Schools.

Are cases of typhoid fever reported to the Board?

Have had 12 cases this fall; no deaths yet.

What diseases do you placard

This was cause of Board being abolished.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 14 cases, 2 deaths; measles, 3 cases, no deaths.

Money spent by Board, including salaries:

None.

WELLINGTON—J. J. Thomas, H. O.

Population, 2,069.

Number and character of nuisances abated:

Many nuisances abated of a general character.

Does the Board hold regular meetings?

Do not hold regular meetings, but as often as necessary.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board

No suits.

Are school children required to be vaccinated?

When necessary.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

All infectious diseases. Cards removed by the Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 7 cases, 1 death; typhoid fever, 1 case, no death.

Is disinfection done under direct supervision of Board? Does the Board furnish disinfectants?

Yes. The Board furnishes disinfectants where families are too poor to do so.

Money spent by Board, including salaries:

Thirteen dollars and forty cents; salary to Health Officer, $50.00.

WELLSTON—F. Z. Wells, H. O.

Population, 4,377.

Have water-works been introduced?

Yes, just finished. We get our water from a creek about one mile from the city close to the bank: wells have been sunk 30 feet deep

Number and character of nuisances abated:

Forty-three stagnant ponds of water, slaughter-houses, manure piles, etc.

Does the Board hold regular meetings?

Only when I can get them together.

Are the orders of the Board enforced without difficulty?

Lots of trouble, but we have brought several parties to time

Suits brought by the Board:

We have had three suits and gained all of them.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes. Some of the physicians do as the Board directs, others report but not as soon as the Board would like.

What diseases do you placard; are cards removed by the Board or by attending physician?

Scarlet fever is all; the Health Officer attends to it

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria 13 cases, 1 death; scarlet fever, 4 cases no deaths; typhoid fever, 11 cases, 4 deaths; measles, 168 cases, 1 death; whooping cough, 31 cases, 1 death.

Is disinfection done under direct supervision of Board?

We have disinfected some but not as much as we ought to have done on the account of not having the disinfectants.

Money spent by Board, including salaries:

Two hundred dollars; this is a very small amount compared to the number of people here, 6,000 strong.

WEST ALEXANDRIA—DR. LEWIS J. ASHWORTH, H. O.

Population, 575.

Number and character of nuisances abated:

The number has not been kept, but they were quite numerous. Two dead horses which were left after stable had been burned. The owner asked the Board of Health to bury them, but finally buried them himself when legally notified. Other things, such as privies, hog-pens, standing water in gutters, dogs, cats, chickens, rats, etc., etc.

Does the Board hold regular meetings?

Once a month is the regular meeting time; did not meet but once or twice this year.

Are the orders of the Board enforced without difficulty?

Yes. We have had but little trouble, and have not had to resort to any legal procedure.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

They are, and it has been enforced, but only when small-pox was near by and danger anticipated.

Are cases of typhoid fever reported to the Board?

Yes, they have been, in a case or two which were in the country. Have had none in town.

What diseases do you placard?

Have had no occasion to placard any as there has been no disease of dangerous character in the village.

Number of cases and deaths from infectious diseases reported during the year:

Typhoid fever, 4 cases in country, 1 death.

Is disinfection done under direct supervision of Board?

Have had no cases that needed any. Don't know whether it is the Board's intention to furnish disinfectants or not.

Money spent by Board, including salaries:

Nothing but salary of Health Officer, which was $25.00 for a year's service.

WESTERVILLE—JNO. W. OYLER, H. O.

Population, 1,329.

Number and character of nuisances abated:

Ninety-five. Such as foul privy-vaults.

Does the Board hold regular meetings?

Once each month.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria, small-pox and other contagious diseases. Cards removed by physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 4 cases, 2 deaths, in vicinity; none in village.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board, including salaries:

Thirty-two dollars and ninety-five cents, from June 15, 1890, to April 28, 1891.

WEST LIBERTY—Dr. Ben. S. Leonard, H. O.

Population (estimated) 1,200.

Number and character of nuisances abated:

Eight. One slaughter-house removed; two defective drains; two full privy-vaults; one filthy-pig pen; one removal of dead animal in stock yards.

Does the Board hold regular meetings?

No regular meetings except annual meetings. Meetings called by President or Health Officer

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None brought.

Are school children required to be vaccinated?

Not required.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Typhoid, diphtheria, scarlet fever, measles, small-pox, etc. Cards removed by attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 2 cases, no deaths; scarlet fever, 4 cases, no deaths; typhoid fever, 5 cases, 1 death, measles, 1 case, no death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes. Do not furnish material unless compelled to do so.

Money spent by Board, including salaries:

About $120.

WILLIAMSBURG—F. M. Wardlow, H. O.

Population, 828.

Number and character of nuisances abated:

Three. One of commercial fertilizer, two of hog-pens.

Does the Board hold regular meetings?

No; we meet about once a month.

Are the orders of the Board enforced without difficulty?

Yes.

Are school children required to be vaccinated?

No; we have not had the need of it yet.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever. Cards removed by the Board.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 8 cases, 4 deaths; whooping cough, 5 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Yes, done under direction of Board. The Board does not furnish disinfectants.

Money spent by Board, including salaries:

For printing, $7 00; Marshal, $2.00.

WILLIAMSPORT—Dr. G. C. Hays, H. O.

Population, 368.

Number and character of nuisances abated:

There were none this year; all were promptly abated on short notice from Health Officer.

Does the Board hold regular meetings?

Once every month.

Are orders of the Board enforced without difficulty?

Yes.

Suits brought by Board:

No suits.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

Yes.

Are cases of typhoid fever reported to the Board?

None to report.

What diseases do you placard? Are cards removed by Board or by attending physician?

Scarlet fever and diphtheria. By physician.

Number of cases and deaths from infectious diseases, reported during the year:

None.

Is disinfection done under direct supervision of Board?

No.

Money spent by Board:

None.

WILLSHIRE—Dr. S. K. Christy, H. O.

Population, 566.

Number and character of nuisances abated:

There have been none abated.

Does the Board hold regular meetings?

They do not.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

They are not.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

No diseases have been placarded.

Number of cases and deaths from infectious diseases, reported during the year:

Typhoid fever, 4 cases, 2 deaths.

Money spent by Board, including salaries:

Not any thing

WOODSFIELD—Dr. C. C. Hall, H. O.

Population, 1,031

Number and character of nuisances abated:

Privy vaults, 4; contaminated well, 1; stagnant pool 1.

Does the Board hold regular meetings?

No.

Are the orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

No suits.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria and scarlet fever. Removed by attending physician by order of Health Officer.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 1 case, no deaths; scarlet fever, 1 case, no deaths; typhoid fever, 3 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

But very little has been done in the way of disinfection. The Board will furnish it.

Money spent by Board, including salaries:

About $65.

I became Health Officer May 1, 1891. The Health Officer before me kept no record, consequently I have no pleasant task in giving this report. The sanitary condition of this town is first class. Its altitude and natural drainage is in our favor.

WOODVILLE—Henry Busch, H. O.

Population (estimated), 800.

Character and extent of improvements in sewerage.

Main street was sewered, extending eighty rods east from west line of corporation limits to Portage River (one-half mile).

Number and character of nuisances abated:

Six privy-vaults

Does the Board hold regular meetings?

Yes, once a month.

Are the orders of the Board enforced without difficulty?

With some difficulty.

Suits brought by the Board:

No suits brought.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by Board or attending physician?

Small-pox, diphtheria, typhoid fever, scarlet fever; cards removed by the Board.

Number of cases and deaths from infectious diseases, reported during the year:

Diphtheria, 7 cases, 2 deaths; measles, 67 cases, no deaths.

Money spent by Board, including salaries:

About $70.

WOOSTER—JOSEPH E. BARRETT, H. O.

Population, 5,901.

Character and extent of improvements in sewerage:

An expensive outlet is being made to Market street sewer, making about double its former capacity. Also a good sewer on North street. North Market street and East North street have been paved with vitrified brick at an expense of about $50,000.

Have water-works been introduced? If so, give source of supply:

The city is supplied with water from springs higher than city. For additional supply they are sinking a well in lower part of town and which can not escape contamination from sewage.

Number and character of nuisances abated:

Fifteen written orders for abatement of nuisances, but numberless ones were abated by verbal notice only. Privy-vaults and hog-pens principally.

Does the Board hold regular meetings?

Yes, monthly.

Are the orders of the Board enforced without difficulty?

No.

Suits brought by Board:

Two persons were arrested for interference with Health Officer and were promptly fined.

Are school children required to be vaccinated?

No, except during epidemics when law is rigidly enforced.

Are cases of typhoid fever reported to the Board?

Yes.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever, typhoid fever and small-pox. By owner or occupants of house.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 20 cases, no deaths; scarlet fever, 6 cases, no deaths; typhoid fever, 8 cases, 4 deaths; measles, 2 cases, no deaths.

Is disinfection done under direct supervision of Board?

No, not entirely.

Money spent by Board:

The city council pays bills and expends the money.

WYOMING—DR. A. M. VAN DYKE, H. O.

Population (estimated), 3,000.

Have water-works been introduced?

No, but will probably be introduced the coming year.

Number and character of nuisances abated:

Nuisances arising from drainage of kitchen sinks, three. One from standing water on vacant lot.

Does the Board hold regular meetings?

First Saturday of every month.

Are orders of the Board enforced without difficulty?

Yes.

Suits brought by the Board:

None.

Are school children required to be vaccinated?

No, not required.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard?

Scarlet fever, diphtheria, measles and small-pox.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 5 cases, no deaths; scarlet fever, 3 cases, no deaths; measles, 2 cases, no deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Not under direct supervision of Board of Health. Board does not furnish disinfectants.

Money spent by Board, including salaries:

One hundred and thirty-two dollars and fifty cents.

XENIA—DR. L. H. BRUNDAGE, H. O.

Population, 7,801.

Number and character of nuisances abated:

Number written notices, 500; verbal, 350.

Does the Board hold regular meetings?

Meetings held first Monday in each month.

Are orders of Board enforced without difficulty?

Yes.

Suits brought by Board:

None.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced?

It is enforced rigidly.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by the Board or by attending physician?

Diphtheria, scarlet fever. Removed by attending physician.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 50 cases, 7 deaths; scarlet fever, 63 cases, 4 deaths; typhoid fever, 13 cases, 3 deaths; whooping cough, 60 cases 1 death.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

Not in better class of people, but always under supervision in poor class, in which case Board furnishes disinfectants.

Money spent by Board, including salaries:

About $600.

YOUNGSTOWN—DR. W. L. BUECHNER H. O.

Population, 33,220.

Character and extent of improvements in sewerage:

There were about two miles of new sewers built.

Number and character of nuisances abated:

One thousand one hundred and forty-five new privy-vaults were built, 1,613 were cleaned; rubbish and garbage were removed from almost every lot in the city. In eight cases nuisances were removed by the Board and the costs assessed against the property on the tax duplicate.

Does the Board hold regular meetings?

Regular meetings second Thursday of each month. Special meetings are frequently called.

Are the orders of the Board enforced without difficulty?

Not without a good deal of fighting; but they can all be enforced if the Health Officer has some backbone and the authorities support him.

If suits were brought by the Board, give character and results of trial in each case:

One party was fined for taking card down; two parties were fined for breaking quarantine; one party was fined for not removing nuisance. Several other parties were arrested for violating regulations of the Board, and were let go with a reprimand on promising to do better.

Are school children required to be vaccinated?

Yes.

Is this requirement enforced:

Yes.

Are cases of typhoid fever reported to the Board?

Yes; but no quarantine is enforced.

What diseases do you placard; are cards removed by Board or attending physician:

Diphtheria, scarlet fever, measles and whooping cough. Cards removed by Board.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 113 cases, 34 deaths; scarlet fever, 300 cases, 14 deaths; typhoid fever, 113 cases, 20 deaths; measles, 119 cases, 1 death; whooping cough, 42 cases, 7 deaths.

Is disinfection done under direct supervision of Board; does the Board furnish disinfectants?

In diphtheria the Board generally disinfects and furnishes the material; in other contagious diseases it is left to the families.

Money spent by Board, including salaries:

For the year ending March 15, 1891, $3,005 15 were expended.

ZANESVILLE—DR. H. T. SUTTON H. O.

Population, 21,009.

Character and extent of improvements in sewerage:

There have been about $25,000 spent in sewerage in this town the past year.

Number and character of nuisances abated:

About 1,400 in all, viz.: Privy-vaults, manure bins, filthy yards and cellars, hog-pens, chicken

coops, water-closets, cess-pools, alleys and gutters, sewer basins, dead animals, ash piles, etc.

Does the Board hold regular meetings?

No; we had but eight meetings last year.

Are the orders of the Board enforced without difficulty?

Yes.

If suits were brought by the Board, give character and results of trial in each case:

Four suits in all. One man for throwing filthy water in street was found guilty and fined. The other three were for keeping hogs in the city. Have not had trial as yet.

Are school children required to be vaccinated?

No.

Are cases of typhoid fever reported to the Board?

No.

What diseases do you placard; are cards removed by Board or by attending physician?

Diphtheria and scarlet fever. All cards are removed upon order of the Health Officer only.

Number of cases and deaths from infectious diseases reported during the year:

Diphtheria, 12 cases, 1 death; scarlet fever, 6 cases, no deaths; typhoid fever, number of cases don't know, 23 deaths; measles, don't know; whooping cough, don't know.

Is disinfection done under direct supervision of Board?

No.

Money spent by your Board, including salaries:

One thousand four hundred and seventy-nine dollars and forty-four cents.

The above includes the hauling of garbage and salaries of Health Officer and Sanitary Police.

SUMMARY OF REPORTS FROM LOCAL BOARDS OF HEALTH.

To those who have followed the growth of sanitary organizations in Ohio, the foregoing reports can not but prove of interest as showing, in a brief manner, the work being done by local boards of health. When the State Board of Health was created in 1886 active boards of health were few in number, and little, often no interest was taken in sanitary work by their members. Later, when the establishment of local boards of health under the act of 1888 was being pushed by the State Board of Health, it was a frequent complaint of health officers that it was impossible to enforce sanitary rules, as the members of boards of health did not have sufficient interest to hold meetings, and it was often impossible to secure a quorum for business.

The past two or three years have witnessed a great improvement in this respect, and it is encouraging to note the growing interest in sanitation shown by our local boards of health, and to witness in many ways the spreading of this interest to all the people. It is a small thing, of temporary benefit to abate a nuisance, or placard a house containing a case of infectious disease, but it is a great thing, of lasting benefit, to educate a community to demand that such things shall be done; and this sentiment has been created in many places in Ohio within the last few years.

Over forty-six per cent. of the boards of health, represented in the foregoing reports, held regular meetings during the year; in most instances monthly meetings were held, though quite a number of boards met weekly during the entire year. Regular meetings mean work to do and an interest in that work; they also mean an improved sanitary condition and better health for the communities having such boards.

Reports of "no regular meetings during the year" do not all mean lack of interest, for called meetings were of frequent occurrence in many places where no provision for regular meetings had been made. But it is always more difficult for members to arrange to attend called meetings, and every board of health should adopt a time for meeting.

Expenditures of Boards of Health.

The amount of money spent by a board of health is, to some extent, an index of the sanitary condition of the community for which it acts. There are many exceptions to this rule, and an active board of interested citizens, assisted by an enthusiastic and *disintere ted* health officer may accomplish much without funds. But work for "glory," especially when donated to a fault-finding, unappreciative community, grows irksome, and is finally abandoned.

More than twenty per cent. of the boards of health that reported expended no money during the year, and paid their health officers no salaries. In more than thirty-six per cent. the amount spent was less than one hundred dollars. The average amount per capita for all the towns represented was eleven cents. But seventy per cent. of the entire amount spent for sanitary purposes was for the cities of Cincinnati and Cleveland alone, the average per capita for these cities being twenty-one cents, which leaves a per capita expense of but five cents for the other towns represented.

People pay liberally and willingly to stamp out an epidemic who object to an assessment for the continued vigilance of a health board which would prevent disease from assuming epidemic proportions. Even the poor showing of financial aid given to boards of health during the past year is an advance over former years, and we have reason to hope for their better support in the future.

Diphtheria and Scarlet Fever.

The number of cases and deaths from diphtheria and scarlet fever, reported by the towns given above, was 3,079 cases of diphtheria and 672 deaths, and 2,773 cases of scarlet fever and 119 deaths. The deaths reported from diphtheria amounted to 21.8 per cent. of the cases; the deaths reported from scarlet fever was 4.7 per cent. of the cases. The rates are probably too high, as in most places the notification of disease is less complete than the reports of deaths.

It will be noted with satisfaction that

Placarding

Houses containing cases of infectious disease is being done in a large number of towns. This measure for preventing the spread of disease is of recent adoption in most places in the State. It had long been the practice to place a colored flag on houses containing cases of small-pox, but it was not considered necessary to give notice of the existence of dis-

eases which were nearly always present. Local boards of health have repeatedly been urged to adopt this measure, but they have heretofore met, and still in some places, meet with considerable opposition from merchants who feared such notices would keep people from coming to their towns and injure business. Even in our largest city—Cincinnati—placarding has not been enforced owing to this objection. Experience has shown that such opposition is without reason, and that such a result does not follow. In fact, a reasonable person will consider placarding as a safeguard, assuring him, when in a strange city, that he need not unknowingly enter a house where infectious disease exists.

Seventy per cent. of the towns furnishing reports enforce placarding. Small-pox, diphtheria and scarlet fever are placarded in all of these, and in some places all contagious diseases are placarded.

It will be noted that the card is removed by the attending physician in many places, when, in his judgment the danger of infection has ended. This is clearly in violation of the intent of the act authorizing boards of health to institute quarantine to prevent spread of infectious diseases (and placarding is a form of quarantine), and cards should only be removed by authority of the board of health, which alone is responsible for permitting one who has been quarantined to prematurely go at large, or for allowing the public without warning to enter a house where a contagious disease has existed prior to its proper disinfection. This leads to the consideration of another most important function of boards of health,

Disinfection.

This is usually left entirely to the attending physician and family; but as the attending physician receives no fee for services of this kind he should not be expected to look after disinfection. At most he can only instruct the family how to disinfect the sick room and its contents; but as it requires great knowledge, care and some experience to properly disinfect a sick room, and as the germs of disease may remain potent for harm for unknown periods unless destroyed by disinfection, boards of health should be held responsible for every infected house, which should be disinfected under the direct supervision of a capable person, acting for the Board.

There was a considerable gain in this direction during the past year, 32 per cent. of the boards that reported having exercised a direct supervision of the disinfection of houses which had contained cases of infectious disease. Many of these boards furnished disinfectants; and it is is be urged that this should be done in all cases, as there would then be no doubt as to proper disinfectants being used in adequate amount.

As disinfection is done for the protection of the general public, it would seem but just that the expense should be paid from the general fund.

Vaccination.

The reports show that vaccination of school children is quite generally neglected, as 78 per cent. of the towns report that vaccination was either not required or not enforced.

Boards of health, however, are not responsible for this neglect, for the enforcement of vaccination is placed in the hands of school boards; and as the matter is optional with them the result is, except in our large cities, where vaccination of school children is strictly enforced—that vaccination is not required until small-pox has appeared.

It may be said, on the whole, that the State is to be congratulated on the work done and progress being made by the local boards of health; and we trust that a better appreciation of their efforts, and a more generous support will be given them.

ABSTRACT OF REPORTS

OF

DEATHS AND THEIR CAUSES

IN THE FOLLOWING

CITIES AND TOWNS IN OHIO,

For the Year ending October 31, 1891.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING 80 CITIES AND TOWNS OF OHIO, DURING THE MONTH OF NOVEMBER, 1890

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under five and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
†Ada	2,700	2	8.10																2												
Akron	27,702	32	13.64	2	4	10	5		1						2	2	1	1	15	3	1	1	1	2	1	3		2	5		4
†Ashley	800	3	30.00	1												1	1		2									1			1
Bellaire	9,901	9	10.91	4	1	1								1		1		1	7	1			2		3			1	2		2
Bellevue	3,260	4	14.72			1								1		1		1											2		
Canton	26,327	19	9.12	3	1	3								1	2	1			12	1		1			2	2		3	2	1	
†Carthage	1,500	9	72.00			4	4									2	1	1	2							1		1	1		
†Celina	2,200	3	16.36	1	1	1								1															2		
Chillicothe	11,256	16	17.05	1	2	3	1							2		3		3	9									2	1		1
Cincinnati	296,951	451	18.23	79	78	100	65				2			24		94	8	74	09	6	9	11	91	9	22	12		39	28	20	44
Cleveland	261,546	263	12.10	32	22	59	28	4		4		1	1	8	1	34	8	19	5	4	1	11	20	12	15	8		29	28	17	27
† Clyde	3,500	2	6.86													1	1		1					1							
Columbus	90,798	95	12.61	7	15	23	10	2	2	1	1			7		21	2	18	32	2	5	1	1	4	5	5		4	6	8	6
†Conneaut	1,500	3	24.00													1		1	1		1								1		
Cuyahoga Falls	2,650	2	9.06																2												
Dayton	58,866	78	15.91	12	9	25	18						1	2		11	1	10	34	2	1		4	2	5	3		5	3	1	7
†Defiance	7,000	6	10.29	1	2	5	2				1																				2
†Delaware	9,000	5	6.66	1		1				1									3					1					1		
Delphos	4,591	3	8.00													1		1	2	2											
East Liverpool	10,947	11	12.06	1	2	3								1					6						2	1		2	1	1	
East Palestine	1,700	2	14.12			1								1					1									1			
Forest	1,134	3	32.14		1	2	2																						1		
†Fostoria	7,800	6	9.23	2		2	1							1															1	1	
Fremont	8,000	2	3.00	1		1													1						1						
†Galion	7,000	3	5.14																2				1		1				1		
†Geneva	3,000	3	12.00			1													2						1			1			
Hamilton	17,510	24	16.38	4	3	4	2							1		7	2	5	10	2			2		1	3		2	1	2	1
Ironton	10,922	22	24.10	3	7	3							1			2	1	1	11	2		1	1		1			3	2	2	
†Jamestown	1,200	4	40.00																2		1				1				1	1	
Kent	3,456	2	6.94			1								1					1	1											
Lancaster	8,873	11	14.88													4		4	6	2		1		2		1			1		

Leetonia	4,000	2	8.00	1															1									1	1		
Logan	3,700	3	9.23		1	1										1		1	1							1					
Mansfield	13,512	14	12.41	2		2										1		1	9		1			4				2	1		1
†Marion	8,000	8	12.00			3								3		3		2	2	1	1										
Middletown	7,764	6	9.28			1			1							2		2											1	2	1
†Nelsonville	5,000	7	16.80	3	3	3	3												3						2		1		1		
New London	1,104	5	54.53			2	1												1								1	1	1		
Oberlin	4,300	4	11.16													2		2	1						1				1		
Painesville	4,616	4	10.34		1	1	1												2	1					1				1		
Piqua	9,669	8	10.58	3	1	1								1		1		1	3					1				2			
Portsmouth	12,387	12	11.62			3	1			1				1		5		5	2	1				1				2			2
†Ravenna	5,000	4	9.60													1	1		3	1				1							
†Reading	4,000	8	32.00		1	1	1												5		1		2	2				2			
†St. Paris	1,800	3	20.00			1	1												1								1	1			
Sabina	1,097	3	32.81	1	1											1		1	1								1	1			
Sandusky	19,234	18	11.23			5	4							1		2	1	1	11		2	1		1			2				
†Salem	6,000	12	21.00	2		5	2							3					5	1		1		1			1	1	1		
†Shelby	2,500	3	14.40	3															2				1		1			1			
Sidney	4,903	3	7.34																3	1				1							
South Charleston	1,011	2	23.07																									2			
Springfield	32,135	35	13.06	1	7	5	1	1						3		8		7	14		1	2		3		1	3	5	3	4	
Tiffin	10,978	23	25.14			12	12									3		3	5	2			1	1	1			2	1		
Toledo	82,652	105	15.24	17	29	40	31		1	1		1		2		14	1	10	31	4	1	3	5		5	1	2	10	7	13	
Uhrichsville	3,972	4	12.08			1								1		1	1											2			
Urbana	6,500	7	12.92	2												2		2	4				1		1		1	1			
Versailles	1,366	3	26.35			2								2					1		1										
Washington C. H.	6,000	4	8.00	1	1											3		3										1	1		
†Waverly	1,600	4	30.00		1	2								1					2	1				1							
†Wooster	8,500	14	19.76			4								4		1		1	5	2			1		1		1	4			
†Xenia	9,000	6	8.00	1												3		2	3												
Youngstown	33,199	48	15.84	12	6	18	10	1	1				1	2		6		6	19	1	1	3	1	2	1	1	5	3	2	2	
Zanesville	21,117	17	9.70	2		5								3		3	1	2	7						2		1	2		3	
Totals	1,271,139	1,509	14.21	206	200	375	207	8	6	9	4	2	4	80	5	251	31	193	654	45	28	37	135	39	88	47	119	141	75	122	

* Premature and still births excluded. † Estimated population.

Crestline reports one death from heart disease; Felicity one from diarrhœa; Garrettsville one from heart failure; Hudson one from diphtheria; Lockland one from phthisis pulmonalis; Mentor one from pneumonia and one still birth; Millersburg one from old age; North Amherst one from old age; Richwood one from apoplexia; Shawnee one from old age; Springboro one from typhoid fever.

Elmwood Place, Higginsport, Mechanicsburg, New Bremen, New Lisbon and Union City report no deaths for the month of November.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 80 CITIES AND TOWNS OF OHIO, DURING DECEMBER, 1890.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
†Ada	2,700	3	13.33			1													1						1				1		
Akron	27,702	50	21.66	5	6	10	7	1								7		6	19	4	1	1	2	1	3			6	6	8	5
†Alliance	10,000	2	2.40			1								1					1		1										
†Ashtabula	6,500	9	16.61	2		2								1		2			3		1					1		1	2		2
Bellaire	9,901	8	9.61	1	1	1								1					7	2		1				1		3			2
†Bellefontaine	5,000	5	12.00													2		1	3	1			1			1					
Bellevue	3,260	3	11.04																												2
Canton	26,327	25	11.39	6	2	7	1							5		4		4	9		1		1			1		2	4	1	
†Carthage	1,500	2	16.00			1	1												1									1			
†Celina	2,200	2	10.91	1												1		1											1		
Chillicothe	11,256	17	18.12	1	1	1								1		3	1	2	5							1		2	3	2	1
Cincinnati	296,951	452	18.94	77	67	95	58	1	6	1	3		4	10		81	11	59	214	9	3	21	19	11	0	12	1	54	41	21	46
Cleveland	261,546	316	14.49	21	37	60	19			3	1	1	3	16	1	54	12	33	145	1	6	8	24	6	21	12	1	38	58	26	44
Clifton	1,565	4	30.67																3			1			1					1	
†Clyde	3,500	5	17.16	1	1	1							1			1	1		1						1				2		
Columbus	90,398	110	14.62	10	13	20	8	1	2					6		21	5	16	48		2	4	5	4	10	3	1	8	5	8	7
†Crestline	3,300	5	18.18													2		2	2	1					1					1	1
Dayton	58,866	73	14.71	12	12	18	12						1	1		11	5	5	34			3	1	2	3	5		9	4	1	9
†Defiance	7,000	8	13.71	3		2								1		1		1	4						2	1			1		3
East Liverpool	10,947	11	12.50	1	2	3	1							2		1			5					1	2	1		1	1	1	1
Forest	1,134	2	21.16	1	1	1	1																						1		
†Fostoria	7,800	9	13.85			2								2					3						1			2	4		
Fremont	8,000	8	12.00		1											4		2	4			1			1			1			
†Galion	7,000	5	8.58			1								1					4									2			
Garrettsville	1,100	2	21.82																1											1	
Hamilton	17,510	26	17.82	4	3	5	3		1							1		1	8	2			1		1	1		3	2	3	
†Hudson	1,600	3	22.50		1	1								1					2									1			
Ironton	10,922	19	20.88	1	5	4	1		1					1		5		4	7	1		2			1	1		2	1		
Kent	3,456	4	13.89	1		1		1								1		1	2	1								1			
Lockland	3,174	3	14.75	1		1						1							1			1								1	
Mansfield	13,542	8	7.09	4		1										3		1	2						2				3		

Marion	8,338	11	15.83			3							1	1		3		3	4						3				1		
Middletown	7,764	8	11.06	1	1	4								3	1	1	1		3						1			2			
†McComb	1,700	2	14.12			1	1																						1		
†Nelsonville	5,000	11	26.40	1	4	7	6									1		1	1									1		2	
†North Amherst	1,600	2	15.00			1							1						1												1
Oberlin	4,300	5	13.95	1												2		2	2									1		1	
Painesville	4,616	7	18.08													5	1	3	2						1			1			
Piqua	9,069	6	7.93													3		2											2		1
†Ravenna	5,000	2	4.80	1												1		1	1	1											
†Reading	4,000	11	33.00													1	1		9												
Richwood	1,434	2	16.97																2									2			
†St. Paris	1,800	2	13.33			1													1						1						
Sabina	1,097	2	21.88	1		1			1																			1	1		
†Salem	6,000	7	14.00													3		3	3									1	2		
†Sandusky	23,000	12	6.26			1	1									1		1	8			2			2			1	2		
†Shelby	2,500	2	9.60	1															2			1			1						
Sidney	4,903	6	14.75	1	2											1		1	3						2				2		
So. Charleston	1,041	2	23.05													1		1											1		
Springfield	32,135	47	17.55	5	5	12	4		1					4		11		10	17	1	2	1	1	1		2		5	6	1	4
Tiffin	13,978	20	22.77		3	5	4							1		4		3	8	1					4	1		1	3		1
Toledo	82,652	109	15.82	25	22	23	16							3		17	3	9	45	3		8	4	2	3	1	2	10	19	5	24
Uhrichsville	3,972	5	17.63			1													3					1				1	1		
Urbana	6,500	7	12.92			1			1							2	1	1	4	1					3				1		1
Versailles	1,366	2	17.57	1												1		1	1							1					
†Warren	7,000	6	10.20		2	2	2												3	2								1		1	1
†Washington, C. H.	6,000	6	12.00	2		3		1								2		2													
†Wooster	8,500	6	8.47		1														6	1		1			1			2			
Youngstown	33,199	49	17.71	14	4	12	8		1		1		1	1		3		3	27		6	1	3	1	4	4		4	4	3	4
Zanesville	21,117	26	14.77	4	1	1										8	2	6	10	1	1	1			2	1		4	1	1	4
Totals	1,260,705	1,526	15.27	200	198	321	154	5	14	4	5	3	12	64	2	279	46	194	715	33	25	55	65	30	102	51	5	175	190	88	164

* Premature and still births excluded. † Estimated population.

Conneaut reports one death from heart disease; Cuyahoga Falls one from pneumonia; Delaware one from typhoid fever; Dunkirk one from Bright's disease; Felicity one from inanition; Glendale one from diabetis; Hicksville one, cause not stated; Logan one from inanition: Mechanicsburg one from pneumonia; Millersburg one from cancer; Springboro one from phthisis pulmonalis; Union City one from hemiphlegia: Waverly one from typhoid fever; West Liberty one from phthisis pulmonalis.

Ashley, Mentor, New Bremen, and Wadsworth report no deaths for the month of December.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 83 CITIES AND TOWNS OF OHIO DURING JANUARY, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Ada	2,700	2	8.88																1		1								1		
Akron	27,702	41	8.01	12	4	6	2		1		1					10	4	5	20	4	2	1	2	1	4	2		4	4	1	5
†Ashtabula	6,500	4	7.38	1		1								1					3						2			1			
Bellaire	9,901	9	10.91	2	1											2		2	5									3	2		
Bellevue	3,260	3	11.04																1						1				2		
Canton	26,327	24	11.09	2	4	3	2						1			7	3	3	14			1	1			2		3	10		
†Celina	2,200	2	10.91			1								1					1									1			
Chillicothe	11,256	16	17.06	1		1	1									2		2	10	1	1				1			3	2	1	
Chicago	1,300	3	29.23																1											1	
Cincinnati	296,951	492	19.88	72	56	86	34		2	6	3	1	5	10	1	91	10	58	253	7	12	20	14	12	23	15	4	58	38	24	48
Cleveland	261,546	391	17.94	32	46	72	18		1	6	1	2	4	17	1	59	10	33	217	5	8	12	32	8	29	14	3	60	26	17	61
Clyde	3,500	3	10.28		1	1							1																1	1	
Columbus	90,398	110	14.71	22	15	17	12		1				1	1		25	4	21	54	1	1	5	7	3	10	5	1	13	5	2	6
†Conneaut	3,000	2	8.00																2		1			1							
Cuyahoga Falls	2,650	2	9.02																2			1						1			
Dayton	58,866	81	16.51	20	11	17	12							1		11	4	4	40	2		4	4	2	3	2		9	9	3	6
†Defiance	7,000	18	30.86	4	3	5	3									1		1	10		2	1	1			2		4	2		
†Delaware	10,000	5	6.00			1								1		3		3	1						1						
Delphos	4,501	7	18.66		2	1										1			3			1	1				1		2		
†Doylestown	1,350	2	17.78																2	2											
East Liverpool	10,947	15	16.44			4		1						2		1	1		7			2	1					3	2	1	1
Elmwood Place	1,983	2	12.10	1												1		1	1				1								
Fremont	7,800	3	4.61													1		1	2									2			
†Fostoria	8,000	5	7.50			4								4					1									1			
†Galion	8,000	9	13.50			1										2	1	1	5		1				1	1		2	1		
†Geneva	3,000	2	8.00	1															2									1			
Ironton	10,992	12	13.10	1	4	1						1				1		1	8			1				1		3	1		
†Jamestown	1,200	2	20.00													1		1	1									1			
Kent	3,456	3	10.41													2	2											1			
Lancaster	8,873	5	6.76		1	3	1					1							2	1					1						
†Logan	4,000	3	9.00													1		1	2						1						

Leetonia	4,000	5	15.00			1										3		1	1						1							
Lockland	2,471	6	29.10	1	3	3									3	1		1	2							1		1				
Mansfield	13,512	5	4.43													1		1	3	1					1			1	1			
Marion	8,3 8	7	10.07		2	2	2									1		1	3	1	2								1			1
Middletown	7,764	2	3.09			1										1		1														
†New Bremen	2,0 0	2	12.00	1		1													1				1									
†New Lisbon	2,750	2	9.10																2													1
†Nelsonville	5,000	9	21.60	4		3	1									2		1	2			1			1				2			
†North Amherst	1,600	7	52.50			2							1						5						3			2				
Oberlin	4,300	3	8.37		1	1	1									1		1	1													
Palmesville	4,646	5	12.93	1												1		1	3	1	1							1		1		
Piqua	9,069	7	9.26	2												2	1	1	4									2	1			2
Portsmouth	12,587	13	12.59	2	4	4	1					1	2			2	1	1	5			2			1			1		2		
†Ravenna	5,000	2	4.80													1		1	1						1							
†Reading	4,000	2	6.00	1	1	1	1												1									1				
†Sandusky	23,000	17	8.87	1		3	1		1					1		2		2	8			2	1		2			3	3	1		
†St. Paris	1,800	2	13.33																2									1				
†Salem	6,000	3	6.00			1					1								3		1											
†Shawnee	3,000	9	36.00	7	2	8						8							2				1					1				
†Shelby	2,500	4	19.20													2	1	1	1						1					1		
Springfield	32,125	46	17.05	8	8	6	4									15	3	9	15	1			2		2	3	1	5	5	4		4
Sidney	4,003	8	19.58		1	3				1									5	2	1							1				
Tiffin	10,978	9	9.08			3	2									3	1	2	1		1								2			
Toledo	82,652	110	15.97	18	23	24	21					2				23	2	23	48	2	10		3	3	3	4		10	6	9		17
Urbana	6,500	11	20.31	4												1	1		11		1		1		1	1		2		1		
Washington C. H.	6,000	8	16.00	4		1	1												6						4				1			3
†Woodville	600	2	40.00		1	1	1																							1		
†Wooster	8,500	9	12.71													2	1	1	3	1					1			1	3	1		
Youngstown	33,190	40	14.46	13	5	10	3				1		1	1	1	4		4	24	1	1	2	4	4	1	1		8	3			7
Zanesville	21,117	22	12.02	3		3	1									3	1	2	8	1	1				1	1			2	4		1
Totals	1,251,697	1,670	15.51	240	172	307	124	1	6	13	7	16	16	40	6	283	51	193	842	34	38	66	87	31	100	55	10	214	139	106		163

* Premature and still births excluded. † Estimated population.

Carthage reports one premature birth; Clifton reports one death from suicide; Garrettsville, one from tabes mesenterica; Gibsonburg, one from typhoid fever, and one still birth; Glendale, one from cholera infantum; Hicksville, one from phthisis pulmonalis; Higginsport, one from old age; McComb, one from gastritis; Millersburg, one still birth; Richwood, one from typhoid fever; New London, one from apoplexia; South Charleston, one from cancer; Springboro, one from meningitis; Union City, one from pneumonia; Versailles, one from phthisis pulmonalis; Wadsworth, one from typhoid fever, and one still birth; Waverly, one from typhoid fever.

Ashley, Felicity, Forest, Hudson, Mechanicsburg and Sabina report no deaths for the month of January.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 79 CITIES AND TOWNS OF OHIO, DURING FEBRUARY, 1891.

Place.	Population, census 1890.	Total deaths, all causes*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet-fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
†Ada	2,700	4	17.77			2								2															2		
Akron	27,702	26	11.26	2	1	6					1					2	1	1	11	2		2			1			6	3	4	3
†Ashtabula	6,800	7	12.35	2												2	2		4				1					3		1	
Bellaire	9,991	5	6.06	1												3		3	2	1								1	1	1	2
Bellevue	3,260	2	7.37	1												1		1											1		
†Canal Fulton	1,800	8	53.33	2	2	5	2	2						1					2		2								1		
Canton																															
†Carthage	1,500	2	16.00													1		1	1						1						
†Celina	2,200	3	16.35	1		1													2			1									
Chillicothe	11,296	12	12.79	2		1										2		2	9						2			5			1
Cincinnati	296,951	477	19.27	73	63	66	26	1	3	3	4		1	17	1	102	13	70	261	10	8	22	26	12	21	18		53	33	15	39
Cleveland	261,546	356	16.33	110	48	73	23	1		8	3	1	3	14	2	43	8	20	195	3	8	22	40	7	19	12	2	44	71	10	55
†Clyde	3,500	4	13.71	1															2		1								2		
Columbus	90,398	95	12.60	14	9	16	9		1				1	4		17	3	13	44		3	4	7	2	4	3	1	16	5	7	7
†Crestline	3,305	3	10.92													2		2	1				1								
Cuyahoga Falls	2,650	5	22.64		1	2													3	1								1			
Dayton	58,866	88	17.96	7	9	11	6						1	1		7	6	10	37	4	2		1	1	3	3		9	8	4	7
†Defiance	7,000	12	20.57	2	1											1		1	8	1			1	1	1			4	2	1	
†Delaware	9,000	8	10.66		1	2	1									1		1	3						1			1	2		
Delphos	4,501	2	5.33	1												1	1		1									1			1
East Liverpool	10,917	13	14.25		2	2								1		1	1		7	1			2		2			2	2	1	3
Elmwood Place	1,983	2	12.10	1		1	1												1				1								1
Forest	1,131	2	21.51																1							1			1		
†Fostoria	7,800	4	6.15													2	2		1						1				1		
Fremont	8,000	5	7.50													2		1	3									2			
†Hamilton	20,000	18	10.30	2	2	3	3												9	2			1		3	1		2	4		
Higginsport	930	3	40.80																1										1		
Ironton	10,922	11	12.08	3		1	1									1		1	5			2	1					1	3		
Kent	3,436	4	10.41													1		1	2	1					1					1	
Lancaster	8,873	9	12.17			2						1				2		2	5						2			2			
†Leetonia	4,000	4	12.00													2		2	4						1						

Logan	3,700	4	12.97												2		2	2						1	1						
†Lockland	3,000	8	32.00		2	1									4		2	3	1		1										
Mansfield	13,542	12	10.64		1	1	1								1		1	6						1				1	1		
†Marion	8,000	6	9.00	1	1	2	2								3		3													1	
†Mechanicsburg	2,000	2	12.00															2													
Miamisburg	2,930	7	28.73		1										2		2	3				1		1				2			
Middletown	7,764	4	6.18		2	2																								2	
Millersburg	1,925	7	43.63		2										1		1	6	1		1	1		1							
†Nelsonville	5,000	4	9.60	1														2		1								1	1	1	
New Lisbon	2,750	3	13.09	2											1		1	1													
†North Amherst	1,600	4	36.00			2						1	1		1	1		1									1				
†Oberlin	4,300	3	8.37	2														3						1				2			
Painesville	4,616	9	23.03			1			1									6	2		1		1					2	1	1	
Piqua	9,069	10	13.25	1	1	2				1					4	1	2	2							1				3		2
Portsmouth																															
†Ravenna	5,000	7	16.80			1									3	1	2	2		1				1					1		
†Reading	4,000	3	9.00												2		2	1													
†Salem	6,000	6	12.00	1											1	1		3						1					2		
†St Paris	1,800	2	13.33															1						1				1			
Sandusky	19,234	9	5.61			2	1						1					7						2			1		1	2
†Shelby	2,500	3	14.40												1	1		2										1			
Sidney	4,903	6	14.68	1		1	1								2	1	1	3						1			1				
South Charleston	1,041	6	69.16												3	1	2	3	2								1				
Springfield	32,135	34	12.69	5	3	4						1	1		5		5	21	1	1	1	4	1		2			2	2	2	
Tiffin	10,978	15	16.39			2	2								6	1	3	4										3			
Toledo	82,652	108	15.68	25	13	17	7			1		3	1	2	20	2	17	53		1	8	11	4	3	3		6	12	6	12	
Uhrichsville	3,972	4	12.08												1		1	2		2								1			
Urbana	6,500	10	18.46	2	1	3							1		2		2	5						1			4				
Versailles	1,166	2	17.57												1		1	1					1								
Washington C. H	6,000	6	12.00	2														4									1		1		
†Wellston	5,000	2	4.80																											4	
†Wooster	8,500	9	12.71												1		1	6	2				1				3	2			
†Xenia																															
Youngstown	33,199	48	17.35	17	7	8		1				1	4		3		3	30		3		1	2	5	4		7	4	3	4	
Zanesville	21,117	15	8.47	2		3	1						2		2		2	7						2			2	2			
Totals	1,229,393	1,579	14.61	297	178	248	87	5	6	13	8	5	11	51	3	289	47	189	819	35	33	65	100	3	85	49	4	186	183	64	146

Ashley reports one still-birth; Bloomingburg one death from consumption; Connaut one death from surgical operation; Felicity one death from old age; Geneva one death from cerebro-spinal meningitis; Huntsville one death from cancer; Sabina one death from exhaustion from uterine tumor; Union City one death from pneumonia.

No deaths reported in Clifton, Waverly, West Liberty, Springboro, New London, New Bremen, Hudson and Jamestown.

* Premature and still births excluded. † Estimated population.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 77 CITIES AND TOWNS OF OHIO, DURING MARCH, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet-fever.	Typhoid-fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Ada	2,079	12	69 26	1	....	3	....	....	1	....	....	....	....	1	....	5	....	4	8	....	....	....	1	....	1	....	....	1	....	....	....
Akron	27,601	24	10.43	3	1	8	1	....	2	....	....	....	....	....	....	5	2	3	9	....	....	....	....	1	2	....	1	5	2	....	4
Ashley	628	2	8.21	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....
Ashtabula	8,358	14	20 26	3	2	1	....	....	....	....	....	....	....	....	....	2	....	2	9	2	....	....	....	....	1	2	....	3	1	....	....
Bellaire	9,931	22	26.57	2	6	2	....	....	....	1	....	....	....	1	....	8	....	7	13	....	....	....	2	1	1	1	....	7	2	....	3
Bellevue	3,052	6	23.62	....	1	1	....	....	1	....	....	....	....	....	....	2	....	2	1	....	1	....	....	....	....	....	....	....	1	....	....
Bellefontaine	4,245	6	16.95	....	....	1	....	....	....	1	....	....	....	....	....	3	1	2	1	....	1	....	....	....	....	....	....	....	1	....	....
Canton	26,189	20	9 16	5	1	1	1	....	....	....	....	....	....	....	....	2	....	1	14	....	....	....	4	....	....	....	....	4	2	1	....
Carthage	2,079	3	17.48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	....	....	1	....	....	....	....	....	....
Celina	2,684	4	17.88	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	1	....	....	1	1	....	1	....	....	....
Chagrin	1,299	2	18.17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	18	19.13	5	1	3	1	....	....	....	....	....	....	2	....	6	....	6	7	....	....	....	1	....	....	1	....	2	2	....	....
Cincinnati	296,908	561	22.67	79	62	59	17	....	4	5	....	1	3	15	....	103	12	71	333	6	10	45	25	8	36	18	1	81	41	22	43
Cleveland	261,353	360	16.52	66	46	67	17	....	....	8	3	3	5	11	7	52	10	33	188	6	8	15	40	5	17	15	2	50	41	12	48
Clifton	1,575	2	15 27	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	1	....	1	....	....	....	....	....	....
Columbus	88,150	128	17 42	15	13	16	8	....	1	....	....	2	1	....	....	31	1	29	56	3	2	1	6	4	10	6	1	11	12	3	10
Crestline	2,111	3	12.36	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	1	....	1	....	....	....	....	....	....
Cuyahoga Falls	2,650	6	27.15	....	1	2	....	....	....	....	....	....	....	....	....	1	....	1	3	1	....	....	....	....	....	....	....	1	....	....	....
Dayton	61,220	79	15.48	13	8	11	7	....	2	....	....	....	....	2	....	22	6	15	35	....	2	2	1	2	6	2	....	9	9	....	6
Defiance	7,694	15	23.41	5	1	....	....	....	....	....	....	....	....	....	....	2	....	2	6	1	1	....	2	....	1	1	....	....	....	1	....
Delaware	8,221	2	29 18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	....	....	....
Delphos	4,516	5	13.28	....	....	1	....	....	....	....	....	....	....	1	....	2	....	2	1	....	....	....	....	....	....	....	....	1	....	....	....
East Liverpool	10,956	8	8.76	1	2	2	....	....	....	....	....	....	....	1	....	1	....	....	5	....	....	....	....	3	1	....	....	1	....	....	1
†Felicity	800	4	60.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	1	....	3
Forest	1,126	4	42.61	1	1	3	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Fostoria	7,070	13	22.06	2	3	2	....	....	2	....	....	....	....	....	....	5	1	4	3	1	....	....	....	....	2	....	....	....	1	....	....
Fremont	7,141	7	11.75	....	....	....	....	....	....	....	....	....	....	....	....	3	1*	3	1	....	....	....	....	....	....	....	....	....	2	....	....
Hamilton	17,565	30	20.49	9	....	5	2	....	....	....	....	....	....	....	1	4	1	3	9	1	....	1	....	....	2	3	....	....	4	....	3
Hicksville	2,141	2	11.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	1	....	....
Higginsport	1,842	3	19.05	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	1	....	....
Hudson	1,119	3	32.17	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2	....	....	1	....	....	....	1	....	....	....	....	....

Ironton	10,939	15	16.45	5	.....	2	....	....	.....	.....	.....	.....	.....	1	.....	5	.....	5	6	.....	.....	2	.....	...	.....	1	.....	1	.....	1	.....
Leetonia	2,826	3	12.73	1	1	1	1	.....	.....	.....	....	.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	1	...	....	.....	.....	.....	.....	.....	.....
Logan	3,119	6	23.08	.....	1	....	.....	.....	.....	.....	....	.....	.....	.....	.....	3	1	2	3	.....	.....	.....	.....	.	2	1	.....	...	....	.....	.....
Mansfield	13,473	13	11.65	3	.....	2	.....	.....	2	.....	.....	.....	.....	.....	.....	2	....	2	6	1	.....	1	....	...	1	.....	.....	1	.....	3	.....
Marion	8,327	3	2.88	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	....	2	.....	.....	.....	.....	...	...	.....	.....	2	.....	.....	.....
Miamisburg	2,932	4	16.26	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	...	.....	4	1	3	.....	.....	....	.....	...	...	....	...	.....	.....	....	...	.....
Middletown	7,681	9	11.06	2	3	.....	.....	....	.....	.....	....	.....	....	.....	.....	3	.....	3	5	.....	.....	.....	....	...	1	3	.....	1	.....	1	.....
Nelsonville	4,558	6	15.79	.....	2	3	1	.....	.....	.....	...	.....	....	.....	.....	1	....	1	1	.....	.....	.....	.....	...	....	.....	.	.....	....	1	.....
New London	1,096	2	21.89	1	....	....	.....	.....	.....	.....	....	.....	....	.....	.....	1	....	1	1	.....	.....	.....	1	.....	.	.....	.....	...	.....	.....	.....
North Amherst	1,618	3	21.81	.....	.....	.....	.....	.....	.....	.....	...	.....	....	.....	.....	....	.....	.....	2	.....	.....	1	.....	.....	1	.....	.....	...	1	.....	.....
Oberlin	4,376	2	5.48	....	....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	1	1	.....	....	.....	.....	.....	.....	...	....	.....	.....	...	1	...	.....
Painesville	4,612	6	15.61	.....	.....	2	.....	.....	....	.....	...	.....	.....	.....	.....	2	.....	2	1	1	....	.....	.....	...	.....	...	.....	...	1	...	.....
Piqua	9,099	10	12.33	.....	.....	1	.....	.....	.....	.....	...	.....	.....	.....	.....	2	.....	1	3	1	.....	.....	.....	.....	1	.....	.....	1	3	1	1
Portsmouth	12,394	15	14.52	.....	.....	1	.....	.....	.....	...	...	..	.....	1	.....	4	1	3	7	1	1	.....	1	...	1	.....	.....	2	3	.....	2
Ravenna	3,117	6	21.01	1	.....	.....	....	.. ..	.....	.....	.....	.....	.....	.....	.....	1	1	....	5	....	....	.....	.....	.....	.....	.....	.....	4	....	.....	.....
Reading	3,103	5	17.33	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	....	4	....	....	.....	1	.....	1	.....	.....	2	....	.....	1
Shawnee	3,251	3	11.07	2	....	1	.....	.....	.....	.....	....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	...	....	....	1
Sidney	4,850	4	9.89	1	.....	.....	.....	.....	.....	.....	....	...	.....	.....	.....	....	.....	.....	3	....	...	.....	.....	...	.....	.....	...	...	1	.....	.....
Springfield	31,856	48	18.09	4	7	1	.....	.....	.....	.....	.....	.....	....	1	....	11	4	7	30	3	4	1	3	1	3	4	.....	6	2	4	5
Tiffin	10,891	16	17.77	.....	.....	5	.....	.. ..	3	.....	.....	.....	.....	.....	.....	2	....	2	9	3	....	2	.....	1	...	.....	.....	3	.....	.....	.....
Toledo	81,131	135	19.89	21	13	19	7	....	1	.....	...	.....	.....	2	.....	28	4	18	65	3	1	7	4	2	9	5	.....	3	14	9	12
Uhrichsville	3,842	8	24.91	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	3	2	....	.....	.....	...	.....	.....	.....	....	2	1	.....	.....
Union City	1,259	2	19.06	.....	1	....	.....	.....	...	.....	.....	.....	....	.....	.....	.....	.....	.....	2	....	....	.....	.....	.....	.....	.....	...	...	...	...	.....
Urbana	6,510	8	14.8	3	1	1	....	....	.....	..	.....	1	.....	.....	....	3	2	1	4	.....	.....	.....	.....	.....	.....	.....	.....	3	...	.....	.....
Washington C. H.	5,742	9	8.81	2	1	2	....	..	1	.....	.....	.....	.....	.....	.....	1	.....	1	4	.....	2	..	.....	2	.	.....	.....	...	2	....	3
Wellston	4,664	13	33.26	.....	.....	2	1	.....		.....	....	1	.....	.....	.....	.....	...	.....	9	....	...	2	.....	....	.....	3	....	4	2	...	.....
West Salem	756	3	47.11	1	1	2	2	...	..	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	.....	.....	.....	.....	.....	.....	...	...	...	1	.....
Wooster	5,909	6	12.20	.....	....	...	.....		.....	.....	.....	.....	.....	.....	.....	1	.....	1	3	1	.. .	.....	...	.....	1	.....	.....	1	2	.	.....
Youngstown	34,270	46	16.61	13	12	10	1	....	2	.....	.....	.....	3	4	...	2	..	1	27	1	2	2	2	5	5	1	..	6	5	2	6
Zanesville	24,079	23	13.62	4	.....	3	.....	...	.....	.....	.....	.....	....	.....	2	4	.....	4	14	1	1	.....	.. .	..	4	.....	..	3	3	2	.....
Totals	1,228,501	1,769	17.29	267	184	253	65	0	25	15	3	9	12	44	9	346	52	251	936	78	37	82	92	37	114	66	5	236	171	65	110

Clyde reports one death from old age; Lockland one from pneumonia; McComb one from old age; New Lisbon one from heart disease; Sabina one from hemoptysis; St. Paris one from heart disease; Salem one death; Springboro one from pneumonia; Wadsworth one from old age and one still birth; Waverly one still birth.

Elmwood, Jamestown, Mechanicsburg, Millersburg, Versailles and West Liberty report no deaths for March.

* Premature and still-births excluded.

† Estimated population.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 78 CITIES AND TOWNS OF OHIO, DURING APRIL, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under 1 year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Akron	27,601	36	15.65	6	2	6	1	....	2	....	....	....	....	....	....	5	1	2	19	....	....	....	3	....	2	1	....	12	5	1	2
Ashtabula	8,338	12	17.26	2	....	2	....	....	....	....	....	1	....	....	....	....	....	....	7	2	....	1	1	1	....	....	1	1	....	1	....
Bellaire	9,934	24	28.98	2	8	5	....	....	....	....	....	....	....	2	....	2	1	1	14	....	....	....	1	....	2	3	....	7	1	2	....
Bellefontaine	4,245	5	14.13	....	....	1	....	....	....	....	....	....	....	1	....	2	1	1	2	1	....	....	....	....	1	....	....	....	....	....	....
Bellevue	3,052	5	19.66	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	1	....	....	....	....	1	....	....	....	....
Canton	26,189	37	16.95	7	1	12	1	....	....	1	....	....	....	....	1	4	....	....	16	3	1	1	....	....	4	1	....	4	2	2	....
Carthage	2,059	5	29.13	....	....	2	....	....	2	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	1	....	....	....	....	....
Celina	2,684	5	20.80	1	3	1	....	....	....	....	....	....	....	....	....	1	....	....	3	....	....	....	....	....	1	1	....	1	....	....	1
Chester Hill	500	2	48.00	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	12	12.75	1	....	3	....	....	....	....	....	....	....	....	....	5	....	5	1	....	....	....	....	....	....	....	....	....	3	....	....
Cincinnati	296,908	610	21.66	99	72	92	16	....	7	4	3	....	4	23	1	107	14	59	339	2	7	40	21	11	31	15	1	98	54	29	55
Cleveland	261,353	612	29.47	129	76	79	23	15	....	12	....	2	3	11	5	92	12	60	437	7	20	54	66	18	25	32	3	158	65	24	55
Clifton	1,577	2	15.87	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	1	1	....	....	....
Columbus	88,150	120	16.45	16	14	12	3	....	2	1	....	....	1	1	....	29	5	21	59	....	1	5	5	5	20	1	....	13	10	8	7
Crestline	2,911	4	16.52	....	1	1	....	....	1	....	....	....	....	....	....	....	....	....	3	....	....	1	.	....	1	....	....	1	....	....	....	....
Cuyahoga Falls	2,650	6	27.02	....	....	4	....	....	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	1	1	....	....	..	....	....	....
Dayton	61,220	72	14.11	20	6	13	7	....	....	....	....	....	....	1	....	9	1	8	37	....	1	3	5	4	3	2	....	7	10	2	2
Delphos	4,516	5	13.29	1	....	2	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Delaware	8,224	9	13.13	....	1	1	1	....	....	....	....	....	....	....	....	2	....	2	6	....	1	....	....	....	2	....	....	2	....	....	....
Defiance	7,694	11	17.29	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	1	1	....	2	....	....	....	3	1	1
East Liverpool	10,956	18	19.71	2	1	1	....	....	....	....	....	....	....	1	....	....	....	....	6	....	....	2	2	....	1	..	....	6	1	2	....
Elmwood place	1,980	2	12.12	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	1	....	....	1	....	....	..	....	....	1
†Felicity	1,200	3	30.00	....	1	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	....	....	....	....	....	....	....	....	1	....	....
Forest	1,126	3	31.97	1	1	2	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	1	....	....
Fostoria	7,070	15	25.46	2	....	7	.	..	7	....	....	....	....	..	....	5	1	3	2	....	....	....	....	1	1	....	....	....	2	....	1
Fremont	7,141	9	15.11	2	....	1	....	....	1	....	....	....	....	....	....	....	....	....	6	....	1	....	1	....	....	....	....	4	1	....	....
Galion	6,326	7	13.28	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	4	....	1	1	....	....	....	1	....	....	....	..	....
Geneva	2,103	4	22.77	....	....	....	....	....	....	....	....	....	....	..	..	....	....	....	4	....	....	....	....	....	....	1	....	3	....	..	....
Glendale	1,444	3	21.94	....	....	1	....	....	....	....	....	....	....	....	..	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Hamilton	17,565	31	28.92	....	....	7	1	....	3	....	....	....	....	....	1	6	....	6	18	1	....	4	....	....	2	3	....	7	1	2	4
Hicksville	2,141	2	11.21	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	1	....	....	....

Higginsport	1,842	1	6.52																	1											
Hudson	1,119	3	32.35																												
Ironton	10,939	20	21.94	1	6	2			1							3	1	2	11	1		1		1		1			2	1	
Jamestown	1,104	1	10.86																1									1			
Lancaster	7,555	11	17.47													5	1	2	6						4			2			
Leetonia	2,826	7	29.69	2	1	3			1										4			1	1			1		1			
Lockland	2,474	2	9.70																2			1				1					
Logan	3,[illegible]19	3	11.25		1	1		1																					1	1	1
Mansfield	13,473	18	16.03	1		2										6		6	7	1								4	3		
Marion	8,347	19	27.5[illegible]	3		2							2			2	1	1	11	1			3		1			6	1	3	
Mechanicsburg	1,459	4	32.8[illegible]																3			1			1			1	1		
Miamisburg	2,952	3	12.18																3						1		1				1
Middletown	7,681	9	14.09	3	1											4	1	3	5					1	1	1		2			
Millersburg	1,923	2	12.48													1	1		1			1									
Nelsonville	4,558	5	13.64		3	2	1						1			1		1	2	1						1					1
New Bremen	1,239	1	9.67			1																									
New London	1,096	2	21.89																2	1								1			
North Amherst	1,618	3	21.23			1													2									2			
Oberlin	4,376	4	10.94			1										1		1	2						1						
Painesville	4,612	2	7.81																2			1						1		1	
Piqua	9,090	12	15.84	1	2	2									1				6	1						1		1			
Portsmouth	12,394	21	20.41	3	1	3	1							2		1	1		12			1	1		3	2		3	4	1	1
Ravenna	3,417	4	14.04													2		2	2									1			
Reading	3,103	6	21.07			1													5				1		2	1					
Salem	5,780	6	12.47	1												1		1	4			1			1				1		1
†St Paris	1,800	3	20.00	1															1									1	2		
Sandusky	18,471	12	7.79			1										2		1	7			1			2			1	1	1	
Shelby	1,917	4	25.[illegible]4			1										2	1	1	1									1			
Sidney	* 4,850	3	7.42																1						1				1	1	
South Charleston	1,011	5	57.35	1												2		2	3			1						2			
Springfield	31,895	34	12.81	4	2	7	4							1	1	8		8	13	2	2	2	1		3	1		1	3	3	7
Tiffin	10,801	22	24.44			5	3		2							4	1	3	10	1	2				2	3		2	2		
Toledo	81,434	117	17.24	21	18	14	7		1							12	1	9	73	2		11	5	2	5	5	1	19	13	5	12
Ubrichsville	3,842	6	18.74			1						1				1		1	4					1				3			
Union City	1,259	3	28.59	1	2	1													2										1		
Urbana	6,510	10	18.43		1											3	1	1	6	1				2	2			1	1		
Versailles	1,385	2	17.54																2	1								1			
Washington C. H.	5,742	8	16.72	2	2	2										3		3	2									2			
Waverly	1,514	1	7.92	1															1				1								2
Wellston	4,694	9	17.91			5			2			3																	2		4
Wooster	5,901	12	24.41			4										2	1	1	6	1						1		4			
Youngstown	33,220	60	21.70	12	5	9	2		3				1	1	1	8	1	7	35		2	1	2	5	6			17	3	5	2
Zanesville	21,009	37	21.14	5	2	18								1		8	1	7	7		1		1					3	4	1	1
Totals	1,236,081	2,241	21.51	257	235	341	72	16	86	20	3	7	13	45	11	356	31	325	1184	31	39	139	122	53	137	81	9	419	208	91	162

Shawnee, Springboro, Bloomingburg and West Liberty report no deaths for April.

* Premature and still-births excluded.

† Estimated population.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 84 CITIES AND TOWNS OF OHIO, DURING MAY, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Akron	27,601	35	15.21	3	3	6	1	.....	....	1	.....	.....	.....	.....	.....	8	2	6	17	1	1	3	.....	.....	4	.....	.....	8	4	....	3
Ashtabula	8,338	13	18.47	5	3	3	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....	1	5	.....	.....	.....	.....	.....	.....	.....	.....	2	2	2	.....
Bellaire	9,934	13	16.00	2	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2	5	.....	.....	.....	.....	.....	1	1	.....	2	3	....	.....
Bellefontaine	4,245	9	25.41	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	4	1	2	3	1	.....	.....	.....	.....	.....	.....	.....	.....	1	....	.....
Bellevue	3,052	4	15.72	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	1	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....
Chillicothe	11,288	15	15.94	1	2	3	1	....	1	.....	.....	1	.....	.....	.....	3	.....	3	9	1	....	.....	.....	.....	4	1	.....	2	...	.	.....
Cincinnati	296,908	534	21.58	80	51	87	20	1	2	8	1	2	4	14	1	117	15	71	259	4	14	27	13	5	16	20	1	48	33	37	50
Cleveland	261,353	412	18.91	15	38	72	24	1	1	12	1	.....	4	9	2	71	10	42	269	8	8	27	47	12	23	20	2	87	48	21	69
Clyde	2,327	3	15.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	1	....	1	.....	.....	.....	.....	.....	.....	.....	2	...	.....
Columbus	88,150	112	15.46	8	9	15	6	.....	.....	.....	.....	.....	.....	4	.....	30	3	26	50	2	4	4	4	3	10	2	1	11	8	6	8
Conneaut	3,241	3	15.46	.....	.....	.....	.....	...	.....	.....	.....	.....	...	.....	.....	3	.....	3	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crestline	2,911	9	37.10	....	.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	7	3	.....	.....	1	1	2	.....	....	.....	.....	.....	.....
Cuyahoga Falls	2,650	9	37.80	....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	7	.....	.....	.....	.....	1	1	.....	1	1	.....	.....	.....
Dayton	61,220	84	16.46	10	10	10	5	.....	.....	.....	.....	.....	.....	1	.....	18	5	10	44	2	.....	5	1	1	8	.....	1	6	8	1	8
Delaware	8,224	9	13.13	.....	1	1	1	.....	.....	.....	.....	....	..	.....	.....	1	.....	....	7	.....	1	.....	.....	.....	2	.....	.....	2	...	....	.....
Delphos	4,516	5	13.27	2	.....	1	.....	.....	.....	2	.....	.....	.....	.....	.....	3	.....	.....	3	.....	.....	1	.....	.....	.....	.....	.....	2	.....	.....	.....
Defiance	7,694	7	10.90	.....	.....	.....	...	.....	.....	.....	.....	..	.....	.....	.....	.....	3	.....	2	1	.....	.....	.....	.....	1	.....	.....	.....	3	..	3
Doylestown	1,131	3	31.83	....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
East Liverpool	10,956	14	15.33	.....	.....	4	.....	.....	1	.....	1	.....	. ..	1	. ...	1	.....	1	9	....	.....	1	1	3	1	.....	.....	3	.....	....	2
East Palestine	1,816	3	19.82	....	.....	1	...	.....	.....	.....	.....	.....	...	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	....	.....	.....	1	.....
Elmwood Place	1,980	3	18.18	.....	....	3	3	.....	...	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....	1
Fostoria	7,070	6	10.84	1	2	.....	...	.....	.....	.....	.....	.....	.....	.....	...	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	....	2
Fremont	7,141	3	5.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	... .	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galion	6,326	5	9.48	1	.....	2	.....	.....	.....	.....	.....	...	1	.....	.....	1	1	.....	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Geneva	2,103	3	17.11	.....	.....	1	.....	.....	.....	.....	...	1	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	..	.....
Glendale	1,414	2	16.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1	.....	...	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Hamilton	17,565	21	11.67	.....	.....	4	.....	.....	1	.....	.....	.....	.....	.....	2	3	1	2	13	2	.....	1	2	.....	3	2	.....	1	2	1	2
Higginsport	1,842	2	13.03	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Ironton	10,939	8	8.76	1	.....	1	.	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	5	.....	.....	.....	1	2	.....	1	.....	.....	.....	.....	1
Lancaster	7,555	7	11.12	1	.....	1	.....	...	1	.....	.....	.....	.....	.....	.....	1	.....	1	5	.....	.....	.....	1	.....	1	.....	.....	3	.....	.....	.....
Leetonia	2,826	6	25.47	1	.....	1	...	.....	.....	1	.....	.....	.....	.....	.....	1	.....	1	3	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....	1

Logan	3,119	6	22.10		1											2		2	3										1		
Mecomb	1,030	3	34.95			1													1										1		
Mansfield	13,373	15	13.86	3		3							1			1		1	6			1	1				1	2			
Marion	8,327	9	12.09		2	2					2					1	1		6						2			4			
Middletown	7,681	4	6.25	2	1	1													3					1				2			1
Millersburg	1,923	2	12.48													1		1											1		
Nelsonville	4,558	2	5.25		2	2	2																								
New London	1,096	2	22.81													1			1						1						
New Paris	842	3	42.82													1		1	2	1					1						
North Amherst	1,648	9	6.55			1							1			2		2	4						1	1		2		2	
Oberlin	4,376	4	10.97	1															3				1							1	
Painesville	4,612	9	23.41			1					1					1		1	5						1			4	1	1	
Piqua	9,090	12	15.84	1		2							1			5	1	4	4	1			1		1			1			
Portsmouth	12,394	13	12.58	1	2	3	1			1			1			2		2	4						1	2		1			
Ravenna	3,417	9	31.66			1							1			1		1	7		1				6						
Reading	3,103	2	7.73																2						1	1					
Sabina	1,080	2	22.22													1		1											1		
Salem	5,789	8	16.69		1	1	1									3	1	2	3					1	1				1		1
Sandusky	18,471	9	5.84			2			2							3		3	3						1			1	1		
Shawnee	3,251	2	7.38																1	1										1	
Shelby	1,917	2	12.52													1	1		1						1						
Springfield	31,895	39	14.98	6	5	4	3					1				4	1	3	22		3	1	1		3			7	7	2	1
Tiffin	10,891	17	18.88			3	2		1							7	2	4	7	1						1		2			
Toledo	81,434	123	18.12	21	16	23	10		5	1			1	1		18	2	12	71	2		5	6	1	10	9		12	7	4	
Uhrichsville	3,812	2	6.21			1													1									1			
Urbana	6,510	11	20.28	2	1	1													7	2					2			3	2	1	
Washington C. H.	5,712	5	10.41	2												2		2	1	1											2
West Liberty	1,200	2	20.00													1		1													
Wyoming	1,454	2	16.57		1	1													1						1						
Wooster	5,900	6	12.37																3							2		1	2	1	
Youngstown	33,220	38	13.72	13	1	4	1			1			1			6		5	25		1	2	4	3	2	4		7		3	3
Zanesville	21,009	27	15.42	4		9	1									3		2	10		1		2		1	2		3	4	1	1
Totals	1,240,890	1,773	16.18	188	53	392	82	3	15	26	7	4	12	39	8	347	51	228	942	35	36	78	87	35	119	70	7	210	149	86	160

Carthage reports one death from old age; Celina one death, cause not stated; Forest one from rheumatism; Hicksville one from meningitis; Kent one from pneumonia; Lockland one from rheumatism; Mechanicsburg one from cancer; South Charleston one from old age; Union City one from la grippe; Versailles one from cancer; Waverly one premature birth.

The following towns report no deaths for May: Ada, Ashley, Bloomingburg, Chester Hill, Clifton, Felicity, Hudson, Jamestown, New Bremen and St. Paris.

* Premature and still-births excluded.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 84 CITIES AND TOWNS OF OHIO, DURING JUNE, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Ada	2,079	3	11.54	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	2	....	....	1
Akron	27,601	22	9.56	1	4	5	....	....	1	....	....	....	....	....	....	7	2	5	7	2	....	....	....	1	3	....	....	1	1	2	....
Alliance	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashtabula	8,338	9	12.95	3	....	2	....	....	....	....	....	....	....	....	1	1	1	....	3	....	....	....	1	1	....	....	....	....	1	2	....
Bellaire	9,931	21	25.37	5	2	7	....	2	....	3	....	....	....	....	....	3	1	2	8	....	....	....	1	1	1	3	....	2	....	2	1
Bellefontaine	4,245	5	14.13	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	1	....	....	....	....	....	....	....	....	3	....
Bellevue	3,052	5	19.66	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	1	....	....	....	1	....	....
Chagrin Falls	1,444	2	16.62	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	....	1	....	....	....	1	....	....
Chillicothe	11,288	8	8.50	....	....	....	....	....	....	....	....	....	....	....	....	3	1	2	2	1	....	....	....	....	....	....	....	1	....	3	2
Cincinnati	296,908	518	20.94	150	76	133	15	35	2	12	7	4	5	21	....	107	16	47	222	2	5	12	20	9	18	31	....	31	32	24	49
Cleveland	261,353	326	14.97	118	133	61	12	14	1	11	1	....	5	4	1	38	9	27	119	7	5	5	42	11	12	20	....	27	30	26	40
Columbus	88,150	84	11.43	17	6	14	5	3	1	1	....	....	1	1	....	20	3	17	31	4	1	2	4	2	5	1	1	7	6	10	6
Conneaut	3,241	7	25.30	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	1	....	1	....	....	2	3	1
Cuyahoga Falls	2,650	2	9.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....
Dayton	61,220	71	13.91	7	8	11	7	2	....	....	....	....	....	....	....	11	4	6	36	3	....	....	2	2	7	5	....	2	4	2	9
Delaware	8,224	4	5.84	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	1	1	1	....	....	1	....	....	....
Delphos	4,516	3	7.97	1	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
East Liverpool	10,956	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fostoria	7,070	3	5.09	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fremont	7,141	6	10.08	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	....	1	1	....	....	1	....	....	....	2	....	....
Galion	6,326	2	6.62	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Geneva	2,103	4	22.77	....	....	1	....	....	....	....	....	1	....	....	....	1	1	....	2	....	....	....	....	1	....	....	....	1	....	....	....
Glendale	1,444	4	33.23	1	....	2	....	2	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Hamilton	17,565	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Higginsport	1,842	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hudson	1,119	3	32.17	....	....	3	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ironton	10,939	13	14.26	4	1	2	....	....	....	....	....	....	1	1	....	2	....	2	8	....	1	....	....	....	4	2	....	....	1	....	....
Kent	3,481	2	6.89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	1	....	....	....	....	....	....
Lancaster	7,555	3	4.76	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	1	....	....	....	....	....	1	....	....	....	....	....	....
Leetonia	2,836	4	16.92	1	2	1	....	....	....	....	....	....	1	....	....	1	....	....	1	....	....	....	....	....	....	....	....	1	1	....	2
Logan	3,119	2	7.69	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1

Marion	8,327	12	17.17	3	....	1	....	1	....	....	....	....	....	....	....	2	2	....	7	....	....	....	....	....	1	....	....	6	....	1	
Mansfield	13,473	10	8.91	3	1	5	....	....	....	....	....	3	....	....	1	....	1	2	1	....	....	....	....	1	....	....	....	2	....	....
Middletown	7,681	7	10.93	3	....	2	....	1	....	....	....	....	....	....	1	....	1	4	....	....	....	....	1	....	3	....	....	....	....	3
Nelsonville	4,558	7	18.43	1	1	1	....	....	1	....	....	....	....	....	3	1	1	1	....	....	....	....	....	1	....	....	....	....	2	....
New Paris	842	2	28.31	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....
Oberlin	4,376	8	8.22	....	....	1	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	1	....	....	....
Painesville	4,612	2	5.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	2	....	....	....	....	....	....
Piqua	9,091	8	10.56	1	3	4	3	1	....	....	....	....	....	....	1	....	....	3	1	....	....	1	....	....	....	....	....	1	....	....
Portsmouth	12,394	16	15.49	3	1	5	2	1	....	....	....	....	....	....	3	1	2	3	....	....	....	....	....	1	1	....	....	3	2	....
Ripley	2,125	6	33.88	1	....	2	....	1	....	....	....	....	1	....	2	....	2	1	....	....	....	1	....	....	....	....	....	1	....	....
St Paris	1,145	2	20.96	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....
Salem	5,780	6	12.46	1	2	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	1	....	....	1	1	....	....
Sandusky	18,471	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shawnee	3,251	2	7.39	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	2	....	....
Shelby	1,917	3	18.78	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Springfield	31,895	27	10.19	9	5	6	2	....	....	....	2	....	....	....	4	....	3	13	....	1	5	3	....	1	2	....	....	1	1	7
Tiffin	10,801	13	14.44	....	....	2	....	1	....	1	....	....	....	....	3	....	2	5	1	....	....	....	....	....	1	....	1	3	....	1
Toledo	81,434	103	15.17	18	9	18	4	3	4	....	....	....	....	1	17	....	14	49	1	....	3	6	5	5	2	....	3	7	12	15
Uhrichsville	3,812	3	9.37	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	1	....	....	....	1	....	....	....	....	....	....
Urbana	6,530	6	11.06	....	1	1	....	....	....	....	....	1	....	....	4	1	3	1	....	1	....	....	....	....	....	....	....	....	....	....
Waverly	1,514	2	15.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	1	....	....	1
Wooster	5,900	4	8.14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	2	....
Xenia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Youngstown	33,220	27	9.78	2	3	5	2	....	....	....	....	1	....	....	6	1	4	10	1	1	....	1	....	6	....	....	1	9	3	6
Zanesville	21,009	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Totals	1,250,734	1 433	11.15	257	255	01	53	68	10	28	8	8	19	29	3	256	47	151	589	30	21	29	81	36	80	73	1	100	118	104	154

* Premature and still births excluded.

Ashley reports one death from apoplexia; Celina, one death from pneumonia, and one still-birth; Clifton, one from Bright's disease; Clyde, one from pythisis pulmonalis; Crestline, one from apoplexia; Defiance, one from cancer and two still-births; E. Palestine, one from violence; Elmwood, one from violence; Forest, one from cirrhosis of liver; Garrettsville, one from pneumonia; Hicksville, one from old age, and two still-births; Lockland, one from phthisis pulmonalis, and one still birth; McComb, one from malarial fever; Millersburg, one from bronchitis; New Londan, one from apoplexia; New Lexington, one from violence; North Amherst, one from pneumonia; Ravenna, one from apoplexia; Reading one still-birth; Sidney, one from general debility; South Charleston, one from meningitis; Springboro, one from heart disease; Union City, one from dropsy; Washington C. H., one from dropsy, and one still birth; Woodville, one from convulsions; Wyoming, one cause not stated.

Doylestown, Sabina and West Liberty, report no deaths.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 94 CITIES AND TOWNS OF OHIO, DURING JULY, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Akron	27,601	23	10.00	7	4	8		5	1							5	1	2	6	1	1		1			2		1	1	3	5
Alliance	7,607																														
Ashtabula	8,335	18	25.91	4		6									3	1			3		1			1	1				1	7	
Bellaire	9,934	11	13.29	3	1	3		2		1						2	1	1	6	1			2	3							
Bellefontaine	4,245	5	14.13			1					1					2		2	1	1									1		1
Carthage	2,059	2	11.65			1		1											1	1											2
Celina	2,684	8	35.80	3	2	2		1											6						1	1					
Chicago	1,299	2	10.71		1	2							1																		
Chillicothe	11,288	12	12.75	3		5		3	2							4	2	2	2	2										1	3
Cincinnati	296,908	533	21.20	69	60	173	26	47	4	19	7	1	8	1	1	99	13	61	204	4	3	7	14	10	29	8	2	12	27	30	62
Cleveland	261,353	645	29.61	323	67	282	25	184	3	9	30			20	6	63	16	27	203	6	5	3	71	18	16	10	1	26	60	37	35
Clyde	2,327	2	10.31	1															1	1									1		
Columbus	88,150	118	16.06	41	14	36	5	21	1	2			1	1	1	17	3	11	31	1		5	3	4	4	3		3	19	9	7
Cuyahoga Falls	2,650	5	22.6	1	1											1	1		4				3		1						2
Dayton	61,220	112	23.58	21	8	31	5	15			2		2	1		15	1	12	40	3		1		1	4	3		2	13	7	13
Defiance	7,691	9	14.03	1	2	5	1						1			1	1		1									1		2	1
Delaware	8,224	5	7.29	1		1				1						3	2	1	1												
Delphos	4,516	6	15.99			4		4								1		1	1		1										2
Doylestown	1,131	2	21.57																2						1						
East Liverpool	10,956	17	18.62	5	1	11	1	5								3		3	2					1	1					1	
East Palestine	1,816	2	13.21		1	1								1					1					1							
Elmwood Place	1,980	5	30.30	3	1	4				3		1																		1	
Felicity	1,200	2	20.00			1	1												1		1										
Fremont	7,141	9	15.12			2		2											4				1		1	1			3		
Galion	6,326	5	9.65		1	1			1										2							2			1	1	
Hamilton	17,565																														
Hicksville	2,141	4	22.42		1											1		1	2						2				1		
Hudson	1,119	4	41.67																4		1				2	1					
Ironton	11,939	18	19.74	4	4	3				1			1	1		2		2	12			1	1		3	2			1		2
Lancaster	7,555	15	23.82	4	1	6		5								3	1	2	2				1		1				3	1	
Leetonia	2,836	6	25.04	4	1	2		1	1										4			1	2			1				1	1

Lockland	2,474	6	29.10			1		1											5						1	1		1				
Logan	3,119	2	7.69			1					1					1	1															
Mansfield	13,473	13	11.58	4	3	5		3	1							3		2	4					1				1				
Marion	8 327	9	12.83	2		5		4						1		2	1	1	2	2												
Medina	2,073	2	11 57																1				1						1			
Mentor	520	2	46.15													1	1												1			1
Miamisburg	2,952	2	8.13													1		1	1					1								
Middletown	7,681	9	14.06	3		3				2						4		3	2				1									
Millersburg	1,923	2	12.48																2													
Nelsonville	4,558	7	18.43	3	1	4	1	2			1					1		1												2		1
New Lisbon	2,278	2	10.53			1		1																						1		
North Amherst	1,648	3	21.84			1		1											2	1				1								
Oberlin	4 376	6	16.22	1		3	2									1		1	1				1									
Painesville	4,612	2	5.20																1						1					1		
Piqua	9,090	9	89.11	5		4		4								1		1	1	1									1	1		1
Portsmouth	12,894	17	16.55	1	1	4			1	1			1	1		3		3	6	2				1					3			
†Ravenna	3 417	21	73.45																1		1											20
Reading	3,108	3	11.60			2		2											1				1									1
Ripley	2,125	9	51 06	2	2	1					1					3		3	1									1	3	1		1
Salem	5,780	6	12 46		1	2	2									1		1	3													1
Sandusky	18,471	15	9.74			9		7	1					1		1	1		3					1						2		
Shawnee	3,251	6	22.14	5		3		3											2				2							1		1
Shelby	1,917	2	12 52	1		1								1					1				1									
Sidney	4,850	9	22.27			1		1								4		3	4				1									
S. Charleston	1,041	3	31 58																2	1										1		
Springfield	31,895	44	16.24	15	9	15	1	7		2		3		2		9	3	6	17			4	2	2	1			1	5	1		3
Tiffin	10,801	11	12 22			2		2								3	2	1	5					1	2		1	1				
Toledo	81,434	152	22.39	56	15	47	7	25	2	3				1	4	20	1	15	59	3	1	2	5	1	4	7		4	11	12		
Union City	1,259	2	19 04		1	1		1								1	1															
Urbana	6,510	3	5.53	1															1					1					2			
Versailles	1,385	2	17.33	1		1		1											1													
Wadsworth	1,574	2	15 23													2		1														
Washington C. H.	5,742	7	14 63	2	1	3		2								1		1	1	1									2			1
Waverly	1,514																															
West Liberty	1,300	2	18.46													1		1	1													
Wooster	5,901	5	10 17	1		1		1								1	1		2						1	1			1			
Wyoming	1,451	3	24.76	1		2		1																					1			
Xenia	7,301	12	14 79	2	2	3	1	1					1			3		3	5		1				2			2		1		1
Youngstown	33,220	54	19.51	15	9	23	2	11		1	1			2	3	5	1	3	22				5	3	2	1		6	2	2		9
Zanesville	21,609	26	14.84	9	3	16		8		2				2		2		2	7		1				2	1			1			2
Totals	1,231,702	2,109	20.54	630	222	756	82	386	18	47	44	5	16	46	18	299	55	182	719	32	22	21	118	49	90	46	5	63	166	129		181

Ada reports one death from typhoid fever; Bellevue one from croup; Chester Hill one from heart disease; Clifton one from consumption; Conneaut one from pleurisy: Dalton one premature birth; Fostoria one still-birth; Geneva one from gastritis; Glendale one from diphtheria; Higginsport one from cholera infantum; Jamestown one from suicide; Kent one still-birth; McComb one from cerebro-spinal meningitis; Mechanicstown one from paralysis, New London one from dropsy; New Paris one from puerperal fever; St. Paris one from meningitis; Uhrichsville one from cholera morbus.

Ashley, New Bremen, Sabina and Springboro report no deaths for July.

* Premature and still-births excluded. † Nineteen killed in a railroad accident.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 94 CITIES AND TOWNS OF OHIO, DURING AUGUST, 18 1.

Place.	Population. census 1890.	Total deaths, all causes.*	Annual rate per 1,000*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Ada	2,079	8	41.36		4	5		2			2			1		1		1	1											2	
Akron	27,601	41	17.83	23	3	21		16								2			10	1	2		2	1	1	2			6	2	4
Alliance	7,607	16	26.57																												
Ashley	628	2	39 81													1		1	1						1						
Ashtabula	8 338	21	14.13	8	3	8		4					1	1	1				4				1	2				2	4	4	1
Bellaire	9,934	10	11.65			3					1			2		3	1	2	3		1					1			1		
Bellefontaine	4,245	7	35.80			1								1		2		2	3								1				
Bellevue	3,052	6	10.71	2	1	2		2											3		1		1		1				1		1
Celina	2,684	8	12.75	2	3	2		1						1					5				1							1	
Chicago	1,299	2	21.20	2					1	1																					
Chillicothe	11,'88	19	29.61	7	1	11		7	2	1				1		4	2	2	3					2	1					1	
Cincinnati	296,908	478	10.31	110	56	112	18	26	4	11	5		5	16	2	96	11	58	215	12	9	8	16	6	30	13		28	31	21	48
Cleveland	261,353	492	16.06	206	71	201	12	110	1	17	27		5	19	5	52	5	25	161	8	8	9	35	18	19	10	1	14	43	22	43
Clyde	2,327	2	22.66		1	1					1								1						1						
Columbus	88,150	114	23.58	21	16	40	4	13		2	2		1	14	1	22	3	16	32	4	1	1	4	1	7	4		5	5	8	9
Conneaut	3,241	5	14.03	2		3		2			1					1		1	1					1							
Crestline	2,911	3	7.29			2		1																						1	
Cuyahoga Falls	2,650	5	15 99	2															2										2	1	1
Dayton	61,220		21 57																												
Defiance	7,694	21	18.62	9	3	8		5		1	1		1			1		1	8	2	1	1		3	1				2	2	1
DeGraff	1,076	3	13.21		1											1		1	1					1					1		2
Delaware	8,224	8	30.30	2		2		1						1					1				1		3				1	1	
Delphos	4,516	2	20.00																2					1		1					1
East Liverpool	10,956	12	15.12	3		5		3					1	1		2		2	2						2				2	1	1
Fostoria	7,070	6	9.65			4		4								1	1		1									1			
Fremont	7 141	8				2	1	1								2	1	1	2		1				1				1	1	
Galion	6,326		22.42																												
Hamilton	17,555		44.67																												
Hicksville	2,141	4	19.71	3		2		1	1										2							1		1			
Ironton	10,939	17	23.82	2	3											5	2	3	5				2	1	2					6	
Kent	3,481	4	25.04		1	1		1								1	1		1									1	1		

Lancaster	7,555	6	29.10			3		1								1		1	2		1			1								2
Leetonia	2,836	8	7.09	2	2	3		2			1					1		1	2					1		1			2			
Lima	15,987	40	11.58	2	3	10	2	4		3						4	2	2	2						2				3	1		
Lockland	2,174	2	12.83		1		1									1																2
Logan	3,129		11.57		1		1		1							3	1	2	1													
McComb	1,030		46.15	2		2		2											1	1												
Mansfield	13,473	18	8.13			4	1	2	1							4		3	9				1		2				1			
Marion	8,327	18	11.06		10	13		10						2	1	3	2	1	2					1				1				
Miamisburg	2,952	2	12.18			1		1											1							1						
Middletown	7,6[illegible]1	13	18.13	4	2	3		3								5		4	4						1	1		2		1	1	
Millersburg	1,923	2	10.53																2		1				1							
Nelsonville	4,558	4	21.84	2		2		1											2					1	1							
New Bremen	1,239	3	16.22	2		1		1								1		1	1				1									
New Paris	812	4	5.20			3				2						1	1															
North Amherst	1,648	2	89.11																1									1		1		
Oberlin	4,376	8	16.55			1										3	1	2	3				1		1				1			
Paineswille	4,612	8	73.45	1		2		1								1		1	4	3					1						1	
Piqua	9,090	13	11.60													5	3	2	3						3						3	1
Portsmouth	12,394	17	51.06	5		3		1			1					5		4	4			1		1	2				3	2		
Ravenna	3,103	8	12.45	5		7					7								1						1							
Salem	5,780	8	9.74	3		3		1						1					3						1				2			
Sabina	1,081	2	22.14	1		1													1							1						
Sandusky	18,471	17	17.52			9		8								1	1		6				1		1				1			4
Shawnee	3,251	5	22.27	2	1	4		3						1		1	1															
Sidney	4,850	8	31.58	4		4		3								1		1	2						1				1			
S. Charleston	1,011	4	16.24			2		1			1					1	1		1	1												
Springfield	31,895	44	16.24	12	10	18	1	5						5	4	5	1	4	17	1			1		2			3	8	2	6	
Tiffin	10,801	12	13.33			4	1	3											7	2				1	2	1			1			
Toledo	81,434	125	18.41	22	14	35	3	15	2				1	1	1	15	3	10	60	3	2	4	3	4	7	2		1	6	9	14	
Urbana	6,510	9	16.43	2												2		2	4					2					3			
Versailles	1,385	3	26.05		1											1	1												1	1		
Walbworth	1,571	3	22.60	1		1		1											1						1					1		
Washington C. H.	5,742	2	4.18		1											2		2														
Wellston	4,691	11	28.09	3	1	8	1	1		2				1					2		1		1							1	3	
West Liberty	1,366	2	18.16		1	1								1					1													
Wooster	5,901	8	16.27	1												3	1	1	2										1	2		
Xenia	7,301	15	24.66	2	6	11	1	4			6					2		2	1					1						1	2	
Youngstown	33,22[illegible]	47	16.97	16	6	22	1	13			2				2	5		2	10		1		1	5		1		2	9	6	5	
Zanesville	21,009	27	11.95	4	9	9		2			1			3		4		4	13		3			1	2	2		1	1	1	2	
Totals	1,234,252	1,843	17.83	197	230	633	49	292	13	41	58	6	15	75	17	278	47	168	658	38	34	25	74	57	103	45	2	65	117	112	156	

Clifton reports one death from typhoid fever; Forest one death, cause not given; Glendale, one from Bright's disease; Hudson one from cholera infantum; Jamestown one from Bright's disease; Mechanicsburg one from pneumonia; New London one from cancer; Ripley one premature birth; Shelby one from diphtheria; Somerfield one from peritonitis; Union City one from abscess; Waverly one from cholera infantum.

The following places report no deaths for August: Elmwood Place, Felicity, Geneva New Lisbon, New London Springboro and Wyoming.

* Premature and still-births excluded.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 86 CITIES AND TOWNS OF OHIO, DURING SEPTEMBER, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence	Premature and still-born
Ada	2,079	4	23.08	2	....	2	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	....	1	....	....	....	1	1	....
Akron	27,601	28	12.17	10	2	9	1	6	....	....	....	....	1	....	....	1	....	1	12	1	2	....	3	....	2	2	1	....	4	2	2
Alliance	6,607	13	23.61	4	11	6	....	1	....	....	....	....	....	5	....	3	2	1	1	....	....	....	....	....	....	....	....	....	2	1	2
Ashtabula	8,338	11	18.23	4	....	5	2	....	....	2	1	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	1	3	....
Bedford	1,043	2	23.01	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....
Bellaire	9,934	9	10.87	5	2	3	....	....	....	3	....	....	....	....	....	1	....	1	2	....	....	....	....	1	1	....	....	....	3	....	1
Bellevue	3,052	4	15.72	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	....	....	....	1	....	1	1
Carey	1,605	5	38.00	....	1	4	4	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Celina	2,684	3	13.47	....	1	....	....	....	....	....	....	....	....	....	....	2	....	1	1	....	....	....	....	....	....	1	....	....	....	....	....
Chicago	1,299	2	18.46	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Chillicothe	11,288	15	15.94	....	2	4	....	....	....	....	1	....	....	1	....	2	1	1	7	....	....	....	....	....	....	1	....	....	....	....	1
Cincinnati	296,908	407	16.41	93	64	84	17	9	3	8	3	1	6	7	3	95	14	47	160	5	5	7	12	6	22	17	....	17	37	31	44
Cleveland	261,353	425	19.51	124	75	132	15	58	1	12	13	....	2	15	5	49	5	24	158	4	4	7	36	12	22	10	....	17	60	26	34
Clyde	2,327	5	25.78	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	....	1	....	1	....	....	....	....	....	....	1	....
Columbus	88,150	101	13.75	24	10	31	3	9	1	4	1	1	3	6	....	26	4	19	28	1	3	2	4	....	3	6	....	6	4	8	3
Continental	895	10	134.19	1	3	10	5	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cuyahoga Falls	2,650	7	31.69	3	1	4	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....
Dayton	61,220	163	20.12	10	8	16	1	....	....	8	....	....	....	3	....	26	7	12	49	1	1	2	....	2	12	....	....	3	8	8	5
Defiance	7,694	5	7.79	2	....	....	....	....	....	....	....	....	....	....	....	3	....	3	1	....	....	....	....	....	1	....	....	....	1	....	4
Delaware	8,224	6	8.16	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	3	....	....	....	....	....	....	1	....	....	2	....	....
Delphos	4,516	4	0.63	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	1	....	....	....	1	....	1	....	....	....	....	1
Doylestown	1,131	2	21.22	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....
East Liverpool	10,956	16	17.43	3	....	0	1	3	....	....	....	....	....	3	....	2	....	2	2	....	1	....	....	....	1	....	....	....	....	2	....
Elmwood Place	1,980	5	30.30	1	....	1	....	....	....	....	....	....	....	1	....	2	....	2	2	....	....	....	1	....	1	....	....	....	....	....	....
Fostoria	7,070	6	10.17	....	....	3	....	1	1	1	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	1	1	1
Fremont	7,141	8	13.16	....	....	3	2	1	....	....	....	....	....	....	....	1	....	1	3	1	1	....	....	....	1	....	....	....	....	1	....
Geneva	2,103	2	11.42	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	1	....	....	....	....	....	1
Hamilton	17,565	22	15.03	4	5	9	5	....	....	....	1	....	....	1	....	3	....	3	8	....	....	....	2	1	2	1	....	1	2	....	2
Hicksville	2,141	3	16.81	....	2	2	....	2	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Ironton	10,939	5	5.48	....	1	1	....	....	....	....	....	....	....	1	....	....	....	....	3	....	1	....	....	1	....	....	....	....	1	....	....
Kent	3,481	4	13.79	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	....	....	....	1	....	....

Lima	15,987	20	15.01	5	.....	8	.....	3	.....	1	.....	.....	.....	4	.....	2	.....	2	8	.....	.....	.....	2	2	1	1	.....	2	.....	2	.....
Lockland	2,474	5	24.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Logan	3,119	6	28.08	2	.....	2	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	3	1	1	.....	.....	.....	.....	1	.....	.....	.....	1	.....
Mansfield	13,173	18	16.04	3	2	3	3	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	4	7	.....	.....	.....	.....	.....	3	.....	.....	.....	2	1	.....
Marion	8,327	12	17.29	3	.....	8	.....	2	.....	.....	.....	.....	.....	5	1	1	.....	1	3	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	2
Mechanicsburg	2,952	3	12.19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	2	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....
Middletown	7,681	7	10.93	1	1	4	2	.....	.....	.....	1	.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....
Millersburg	1,923	3	18.25	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Nelsonville	4,578	5	13.16	1	1	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....	.....	.....	.....	1	.....	1	.....
North Amherst	1,648	4	23.05	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Oberlin	4,376	4	10.97	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painesville	4,612	7	10.41	1	.....	3	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	3	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Piqua	9,090	7	10.97	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	3	.....	.....	.....	1	.....	.....	.....	.....	1	.....	2	.....
Portsmouth	12,391	11	10.64	1	1	2	.....	.....	.....	.....	1	.....	.....	1	.....	3	1	2	3	.....	.....	.....	.....	.....	2	1	.....	.....	3	.....	3
Ravenna	3,417	6	22.21	.....	.....	4	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Sabina	1,080	2	22.22	1	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem	5,780	9	18.73	2	.....	3	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
Sandusky	18,171	8	5.19	.....	.....	3	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	1	1	.....	.....	1	.....	.....
Shawnee	3,251	4	14.80	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shelby	1,977	2	12.14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1
Sidney	4,850	6	14.46	1	2	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
South Charleston	1,041	6	69.92	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
Springfield	31,895	42	5.80	5	7	16	1	4	.....	.....	2	.....	2	3	.....	8	5	3	10	1	1	.....	3	.....	.....	1	.....	2	6	2	3
Summerfield	582	4	82.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....
Tiffin	10,801	13	11.44	.....	.....	4	1	2	.....	1	.....	.....	.....	.....	.....	1	1	.....	3	.....	1	.....	1	1	.....	.....	.....	.....	3	2	.....
Toledo	82,652	106	15.34	35	11	31	2	9	.....	7	.....	.....	.....	5	7	10	2	7	18	6	.....	4	4	1	4	3	.....	5	10	4	13
Urbana	6,510	11	20.27	4	.....	3	.....	1	.....	.....	.....	.....	.....	.....	2	1	.....	1	5	2	.....	.....	.....	2	1	.....	.....	.....	2	.....	.....
Versailles	1,385	4	4.66	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Wadsworth	1,571	5	38.12	2	.....	3	.....	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....
Washington C. H.	5,742	4	8.35	2	.....	2	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Wellston	4,091	9	6.13	.....	.....	4	.....	.....	.....	1	.....	.....	.....	3	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	5
Wooster	5,991	9	18.31	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	7	.....	.....	.....	1	2	2	.....	.....	1	.....	1	.....
Xenia	7,501	16	26.10	2	5	10	.....	2	1	.....	6	.....	1	.....	.....	2	.....	2	4	1	1	.....	.....	.....	1	.....	.....	1	.....	.....	1
Youngstown	33,220	53	19.14	11	11	19	3	6	.....	.....	2	.....	2	3	.....	8	3	5	16	2	2	.....	5	2	1	1	.....	3	11	3	4
Zanesville	21,069	27	15.43	2	1	14	2	2	.....	1	.....	.....	.....	7	.....	3	.....	2	8	.....	.....	.....	.....	1	1	1	.....	2	2	1	.....
Totals	1,252,106	1,713	16.41	397	211	505	74	137	9	50	35	3	17	87	19	279	51	103	627	35	29	23	77	35	100	50	1	66	179	114	134

Archbold one premature birth; Crestline one death from Bright's disease, and one premature birth; Felicity one death, cause not given; Jamestown one from cerebro spinal meningitis; Lectonia one from cerebro-spinal meningitis; McComb one death, cause not stated; New Bremen one from cancer; New Lisbon one death from measles; Reading one death from congestion of lungs; Springboro one death from consumption; Union City one death from typhoid fever; Wyoming one death.

Ashley, Conneaut, DeGraff, Forest, Hudson, Miamisburg, New London and New Paris report no deaths for the month of September.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES IN THE FOLLOWING 68 CITIES AND TOWNS IN OHIO, DURING OCTOBER, 1891.

Place.	Population, census 1890.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under one year.	Total under 5 and over 1 year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhœa.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping-cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.
Ada	2[illegible]79	2	11.49		1	1													1						1						1
Akron	27,601	30	13.[illegible]4	2	2	9				1	1		2			9	1	6	5			3		1	1				5	2	5
Alliance	6 607	9	16.35		1	2								2					5						1			1	1	1	
Archbold	780	3	16 15			2	1							1															1		
Ashtabula	8,3[illegible]8	10	14.39	2		4							1	2					1									1	2	3	
Bellaire	9,934	6	7 06		3	4	3	1											2						1			1			
Bellevue	3,052	4	15.07	1		1		1											2		1							1		1	
Bloomingburg	638	4	75 23			2								2		2		2	1						1						
Carey	2,009	6		2	3	5	4									1		1													
Carthage	2,039	3	17.64			1	1									1		1	1			1									1
Celina	2,684	2	8.[illegible]2		1	1									1				1						1						
Chillicothe	11,288	11	11.69	1	4	5	1			2				2		3	1	2											1	2	2
Cincinnati	296,908	484	19.53	99	59	105	29	5	2	7	5	1	11	21	2	85	13	44	253	6	7	19	10	6	35	13		32	36	25	41
Cleveland	261,353	380	17.14	105	159	100	37	18		11	9			16		18	7	26	163	2	4	14	29	18	22	6	1	27	37	26	28
Clifton	1,575	5	38 09		2	2	2												2		1				1				1		
Columbus	88,150	136	18.51	17	16	32	11	3	1	5	1	1	2	7		28	8	18	55	3	3	4	3	6	10	4	1	8	10	7	11
Continental	895	7	93.85			7	4																								
Crestline	2,911	2	8 24																1		1									1	
Cridersville	701	4	68.47		1	4		1						3																	
Cuyahoga Falls	2,650	2	9 5			1	1									1		1													
Dayton	61,220	96	18 98	11	8	13	5	2		1	1					21	7	13	41	1	2	1	3	1	8	2		4	9	6	7
Defiance	7,691	5	7 79	1												1	1		2	1								1		1	1
Delphos	4,516	5	13.28			3		2						1		1		1												1	2
East Liverpool	10,956	10	10.95			4		2			1								5	1				1		1	1	1	1		
Elmwood Place	1,980	5	13.28		3	4	3	1								1		1													1
Fostoria	7,070	7	10.25	1												2	2		4		1				3						
Fremont	7,141	9	15.12	1		1								1		1		1	5				1	1					1	1	
Geneva	2,103	2	11 41													1			1						1						
Hamilton	17,565																														
Ironton	10,[illegible]3[illegible]	15	16 63	2	2	4	3									2		2	8	1						1					
Kent	3,481																														
Lima	15,987	11	8 25	1	2	7	3	2								2		2	2					1		1					

Leetonia	2,826	3	12.73	1	..	1	1									2		2														
Logan	3,119	2	7.69																1	1										1		
Mansfield	13,473	20	17.81	4	4	11	7				1				3		1		1				2		1					2	2	
Marion	8,327	11	15.8	4		7	1	4							2					4	1				1			2				
Mechanicsburg	2,952	3	12.19														1		1	2					1	1						
Mentor	820	4	9.23			1	1													1		1								2		1
Middletown	7,681	10	15.62	1	2	5	4										1		1	4	1					2		1				2
Millersburg	1,923	2	12.48			1		1												1					1							
Nelsonville	4,558	8	15.79	3	2	2	2										1	1		4					1	1			2		1	3
New London	1,096	2	21.89																	1	1									1		
North Amherst	1,648	3	29.12														1	1		2					1		1					
Oberlin	4,376	2	5.48																	2						1						
Painesville	4,612	2	5.21														1	1												1		
Piqua	9,090	12	15.84	1		1											2	1	1	7		1	1	1	1	1			1	2		
Portsmouth	12,[illegible]94	11	10.65	1		4	1								3		1	1		5						3				1		4
Ravenna	3,417	5	17.55			5	4																									
Reading	3,103	2	7.73																	2					1			1				
St. Paris	1,800	2	13.44			1									1															1		
Salem	5,580	10	20.76	3	2	5	2								3		2		2	3												
Sandusky	18,471	6	3.35			4	1	1					1		1					2												
Shawnee	3,251	4	14.79	1																										2	1	1
Shelby	1,917	3	18.67			1									1					1	1									1		1
Sidney	4,850	7	17.32	2	2	1	1										1	1		5				2		1						
Springfield	31,895	37	13.92	6	2	9	3		1		1				3	3	10	1	9	11		2				1	1		2	4	3	1
Tiffin	10,801	16	18.24	1		2	2										2	1	1	7	1		1	1	2	1	1			4	1	
Toledo	82,652	119	17.27	34	19	36	16	3	2	4	1		1	3	3	10	2	7	51	2		6	3	3	11	2	1	7	15	7	11
Urbana	6,510	5	9.21			1								1		2		1	2						1							
Uhrichsville	3,812	9	28.10	2		1								1					4						2	2			4			
Wadsworth	1,571	2	15.54	1		1		1											1		1											
Washington C. H.	5,712	7	11.13	1		1	1									4		4													1	
Wellston	4,091																															
Wooster	5,901	5	10.13													2		1	2						1						1	
Wyoming	1,454	2	16.23	1		1	1												1													
Xenia	7,301	21	34.52	2	3	7	5		1		1					7		7	6	2		1			3						1	
Youngstown	33,220	52	18.78	16	10	30	13	8	1			1	2	3		2	1	1	12	1			1	1	2	5		1	4	3	3
Zanesville	21,009	30	17.13	4	1	12		1						7		5		5	10			1		4		1			2		1	
Totals	1,249,395	725	16.33	338	328	479	175	57	10	29	22	3	21	91	8	268	51	165	712	26	26	53	56	49	120	45	4	95	155	98	128

Chicago one death from violence; Cleves one from diphtheria; Clyde one from pneumonia; Delaware one from bronchitis; DeGraff one from scarlet fever; Forest one from gastritis; Lockland one from Bright's disease; McComb one from meningitis; Sabina one from typhoid fever; Springboro one from general debility, Versailles one from old age.

Ashley, Doylestown, Hicksville, Hudson, New Bremen, New Paris, South Charleston and Union City report no deaths for October.

SUMMARY OF MORTALITY REPORTS.

The total number of deaths reported from all causes—excluding premature and still-births—by the towns represented in the foregoing tables was 20,960. The average estimated population of the cities and towns represented was 1,244,800, which is equal to an annual death rate of 16.88 per thousand living population represented.

The deaths in 1,212,727 living population in 1890 (November, 1889, to November, 1890) were 21,648, equal to an annual death rate of 17.85 per thousand; while in 1889 (November, 1888, to November, 1889), the total number of deaths reported in 1,197,840 population was 16,762, equal to a mortality rate of 14.16 per thousand.

The number of deaths reported each month was as follows:

January	1,670	July	2,109
February	1,579	August	1,843
March	1,769	September	1,713
April	2,241	October	1,725
May	1,773	November (1890)	1,509
June	1,433	December (1890)	1,596

The greatest number of deaths (2,241) was reported in April, the least number (1,509) in November.

DEATHS OF CHILDREN UNDER FIVE YEARS OF AGE.

The number of deaths reported of children under five years of age (premature and still-born excluded), was 6 631, which is equal to 31 per cent. of the deaths from all causes, and a death rate of 5.32 per thousand population represented. The death rate of children under five the preceding year was 6 27 per thousand population represented.

The deaths by months, of children under five, were as follows:

January	412	July	1,152
February	455	August	727
March	451	September	608
April	492	October	676
May	341	November (1890)	406
June	512	December (1890)	399

The greatest number of deaths reported in children under five (1,152) was in July; the least number (341) was in November.

ZYMOTIC DISEASES.

The total number of deaths reported from zymotic diseases was 4,842, which is equal to nearly 23 per cent. of the deaths reported from all causes, and an annual rate of 3.9 per thousand of the population represented.

The number of deaths reported the preceding year from zymotic diseases was 5,390, equal to a death rate of 4.4 per thousand population represented.

The number of deaths reported from zymotic diseases each month was as follows:

January	307	July	756
February	248	August	633
March	253	September	505
April	344	October	497
May	292	November (1890)	375
June	301	December (1890)	321

The month having the greatest number reported (756) was July; the one having the least (248) was February.

CROUP AND DIPHTHERIA.

The total number of deaths reported from croup and diphtheria was 1,224, which is equal to 5.8 per cent. of the deaths reported from all causes, and a death rate of .98 per thousand of the population represented.

The number of deaths reported the preceding year from these causes was 1,714, equal to a mortality rate of 1.41 per thousand of the population represented.

The number of deaths reported each month from croup and diphtheria was as follows:

January	124	July	82
February	87	August	49
March	65	September	74
April	72	October	175
May	82	November (1890)	207
June	53	December (1890)	154

The month having the greatest number reported (207) was November; the one having the least number (49) was August.

CHOLERA INFANTUM AND DIARRHŒA.

The total number of deaths reported from cholera infantum and diarrhœa was 1,303, which is equal to nearly 6 per cent. of the deaths

reported from all causes, and a mortality rate of 1.05 per thousand population represented.

The total number of deaths reported from these diseases during the preceding year was 1,275, equal to a mortality rate of 1.05 per thousand population represented.

The deaths as reported by months were as follows:

January	14	July	433
February	18	August	333
March	15	September	187
April	36	October	86
May	29	November (1890)	17
June	96	December (1890)	9

The month having the greatest number reported (433) was July; the one having the least (9) was December.

MEASLES, SCARLET FEVER AND WHOOPING COUGH.

The total number of deaths reported from measles, scarlet fever and whooping cough was 342, which is equal to 1.6 per cent. of the total number of deaths reported from all causes, and a mortality rate of .27 per thousand of the population represented.

The total number of deaths reported from these diseases during the preceding year was 569, equal to a mortality rate of .46 per thousand population represented.

The deaths, as reported by months, were as follows:

January	38	July	39
February	19	August	32
March	30	September	39
April	31	October	32
May	24	November (1890)	11
June	30	December (1890)	17

The months in which the greatest number of deaths were reported (39) were July and September; the least number (11) was reported in November.

TYPHOID FEVER.

The total number of deaths reported from typhoid fever was 691, which is equal to 3.3 per cent. of the total number reported from all causes, and a mortality rate of .55 per thousand population represented.

The number of deaths reported from this cause the preceding year was 748, equal to a mortality rate of .62 per thousand living population represented.

The number of deaths from typhoid fever, as reported by months, was as follows:

January	40	July	46
February	51	August	75
March	44	September	87
April	45	October	91
May	39	November (1890)	80
June	29	December (1890)	64

The greatest number of deaths (91) was reported in October; least number (29) in June.

CONSTITUTIONAL DISEASES.

The total number of deaths reported from constitutional diseases was 3,576, which is equal to 16 per cent. of the deaths reported from all causes, and a mortality rate of 2 80 per thousand population represented.

The number of deaths reported from constitutional diseases the preceding year was 3,576, equal to a mortality rate of 2.94 per thousand population represented.

The number of deaths as reported by months was as follows:

January	283	July	279
February	289	August	278
March	346	September	279
April	356	October	268
May	347	November (1890)	251
June	256	December (1890)	279

The greatest number of deaths (356) was reported in April; the least number (251) was reported in November.

CANCER.

The total number of deaths reported from cancer was 579, which is equal to 2.7 per cent. of the deaths reported from all causes, and a mortality rate of .46 per thousand population represented.

The deaths as reported by months were as follows:

January	51	July	55
February	47	August	47
March	52	September	51
April	31	October	51
May	51	November (1890)	31
June	47	December (1890)	46

The month having the greatest number reported was July (55); the months having the least (31) were April and November.

CONSUMPTION.

The total number of deaths reported from consumption was 2,402, which is equal to 11 per cent. of the deaths reported from all causes, and a mortality rate of 1.9 per thousand population represented.

The number of deaths reported from this cause the preceding year was 2,457, equal to a mortality rate of 2.02 per thousand population represented.

The number of deaths as reported each month was as follows:

January	193	July	182
February	189	August	168
March	251	September	163
April	325	October	165
May	228	November (1890)	193
June	151	December (1890)	194

The greatest number of deaths was reported in April (325); the least number (151) in June.

LOCAL DISEASES.

The total number of deaths reported from local diseases was 9,397, which is equal to 45 per cent. of the deaths reported from all causes, and a mortality rate of 7.5 per population represented.

The number of deaths reported from local diseases the preceding year was 9,340, equal to a mortality rate of 7.7 per thousand population represented.

The deaths reported by months were as follows:

January	842	July	719
February	819	August	658
March	936	September	627
April	1,184	October	712
May	942	November (1890)	654
June	589	December (1890	715

The month having the greatest number of deaths reported (1,184) was April; the one having the least number (589) was June.

BRONCHITIS, PLEURISY AND PNEUMONIA.

The total number of deaths reported from bronchitis, pluerisy and pneumonia was 2,809, which is equal to 13 per cent. of the deaths reported from all causes, and a mortality rate of 2.2 per thousand of the population represented.

In the preceding year there were 2,764 deaths reported from these causes, equal to a mortality rate of 2.2 per thousand population represented.

The deaths, as reported by months, were as follows:

January	290	July	92
February	255	August	92
March	323	September	90
April	567	October	152
May	325	November (1890)	156
June	130	December (1890)	237

The month in which the greatest number of deaths was reported was April (567); the least number (90) was reported in September.

CONVULSIONS AND MENINGITIS.

The total number of deaths reported from convulsions and meningitis was 1,675, which is equal to 8 per cent. of the deaths reported from all causes, and a mortality rate of 1.34 per thousand population represented.

The number of deaths reported from these diseases the preceding year was 1,883, equal to a mortality rate of 1.55 per thousand population represented.

The deaths, as reported by months, were as follows:

January	142	July	164
February	149	August	119
March	158	September	127
April	203	October	101
May	157	November (1890)	182
June	157	December (1890)	116

The greatest number of deaths was reported in April (203); the least number (101) in October.

DEVELOPMENTAL DISEASES.

The total number of deaths from developmental diseases reported (excluding premature and still-births) was 1,946, which is equal to 9 per cent. of the deaths reported from all causes, and a mortality rate of 1.56 per thousand population represented. During the preceding year there were 2,019 deaths reported from developmental diseases, equal to a mortality rate of 1.66 per thousand population represented.

The deaths, as reported by months, were as follows:

January	139	July	166
February	183	August	147
March	171	September	179
April	208	October	155
May	149	November (1890)	141
June	118	December (1890)	190

The greatest number of deaths (208) was reported in April; the least number (118) in June.

PREMATURE AND STILL-BIRTHS.

The total number of premature and still-births reported was 1,680, which is equal to 8 per cent. of the deaths reported from all causes, and a rate of 1.34 per thousand population represented.

During the preceding year there were 1,804 premature and still-births reported, equal to a rate of 1.49 per thousand population represented.

The premature and still-births, as reported by months, were as follows:

January	163	July	181
February	146	August	156
March	110	September	134
April	162	October	128
May	160	November (1890)	122
June	154	December (1890)	164

The greatest number (181) was reported in July; the least number (110, with Cincinnati not reporting) was in March.

VIOLENCE.

The total number of deaths reported from violence was 1,132, which is equal to 5 per cent. of the deaths reported from all causes, and a mortality rate of .91 per thousand population represented.

During the preceding year there were 1,011 deaths reported from violence, equal to a mortality rate of .83 per thousand population represented.

The deaths, as reported by months, were as follows:

January	106	July	129
February	64	August	112
March	65	September	114
April	91	October	98
May	86	November (1890)	75
June	104	December (1890)	88

The greatest number of deaths was reported in July (129); the least number (64) in February.

REPORTS OF

METEOROLOGICAL OBSERVATIONS

FOR THE

Year Ending October 31, 1891.

FURNISHED THE STATE BOARD OF HEALTH BY THE

OHIO METEOROLOGICAL BUREAU.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF NOVEMBER, 1890 FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9. P. M. to 7 A. M.									
Cincinnati	.....	.....	30.146	30.462	22d.	29.766	2d.	.626	73.2	47.8	72.0
Dayton	0.77	1.27	30.124	30.429	22d.	29.656	17th	.773	79.4	45.8	69.0
Greenville	.....	.....	30.056	30.339	11th	29.642	17th.	.697	80.1	43.2	65.0
Celina	.....	.....	30.101	30.412	22d	29.665	17th	.747	81.0	45.6	68.3
Upper Sandusky	3.93	3.53	30.087	30.384	11th	29.581	17th.	.803	61.6	43.8	67.0
Findlay	.....	.....	30.089	30.406	11th	29.592	17th.	.814	82.8	42.4	67.0
Wauseon	1.67	1.83	30.089	30.427	16th	29.655	17th.	.772	75.6	40.3	69.2
Clarksville	3.17	3.20	30.137	30.419	22d	29.646	17th	.773	76.8	44.3	69.3
Yellow Springs	.....	.....	30.063	30.360	22d	29.559	2d.	.801	80.2	44.2	68.7
North Lewisburg	0.93	1.10	30.113	30.470	22d.	29.602	17th.	.868	81.9	43.7	67.0
Bangorville	.....	.....	28.640	28.897	11th.	28.288	17th.	.509	76.0	41.6	65.3
Toledo	.....	.....	30.089	30.421	16th.	29.698	17th	7.3	73.4	41.4	68.0
Sandusky	0.47	0.43	30.071	30.400	16th.	29.553	2d.	.848	72.2	44.1	70.0
Hanging Rock	0.07	0.17	30.125	30.386	22d.	29.754	17th.	.612	85.7	46.8	75.0
Portsmouth	.....	.....	30.130	30.359	22d.	29.720	17th.	.639	80.8	47.5	76.5
Waverly	.....	.....	30.117	30.339	22d.	29.657	17th.	.682	76.6	48.1	75.0
Georgetown	.....	.....	30.128	30.372	22d.	29.648	17th	.724	84.7	46.5	72.0
Columbus	.....	.....	30.116	30.363	16th.	29.703	2d.	.660	73.0	44.6	70.0
O. S. University	.....	.....	30.096	30.367	11th	29.624	17th	.743	78.0	43.5	71.0
Westerville	0.40	0.59	30.085	30.357	16th	29.592	17th.	.765	82.0	43.8	68.0
Logan	.....	.....	30.112	30.369	28th	29.715	17th	.654	82.7	45.0	74.0
Oberlin	.....	.....	30.089	30.384	10th.	29.608	17th	.776	79.1	42.7	67.0
Marietta	.....	.....	30.131	30.353	16th.	29.713	17th	.640	76.9	46.6	74.0
McConnellsville	.....	.....	30.115	30.348	.....	29.635	17th.	.713	84.5	44.9	73.3
Pomeroy	.....	.....	30.123	30.387	11th.	29.834	17th	.553	86.7	45.7	73.0
Athens	.....	.....	30.150	30.390	11th.	29.729	17th	.661	77.0	45.1	75.0
Newcomerstown	.....	.....	30.093	30.376	22d.	29.624	17th.	.752	80.8	42.5	69.5
New Alexandria	.....	.....	.....	.....	.....	.....	.....	.....	82.4	43.3	69.0
Canton	.....	.....	30.086	30.402	16th.	29.637	17th.	.765	.....	42.0	66.6
Youngstown	1.23	1.17	30.050	30.325	11th.	29.688	17th	.637	84.2	43.5	67.0
Hiram	.....	.....	30.069	30.400	16th	29.569	17th.	.841	80.6	40.2	64.4
Jefferson	.....	.....	30.107	30.431	16th.	29.654	2d	.777	82.1	40.4	64.0
Wooster	2.37	1.87	30.106	30.410	16th.	29.631	17th.	.809	79.7	41.3	66.0
Cleveland (S. O.)	.....	.....	30.080	30.447	16th	29.616	2d.	.831	71.8	43.4	63.0
Cleveland (Hyde)	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.7	67.5
Akron	0.00	0.00	30.074	30.410	16th	29.592	17th	.818	82.5	42.3	65.1
Hudson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weymouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellsworth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lordstown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellevue	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garrettsville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kenton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waynesville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springboro	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jacksonburg	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Circleville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State	.....	.....	30.101	30.470	22d.	29.553	2d	.917	80.1	43.9	76.5

The mean atmospheric pressure, 30.101 inches, was .007 inch, below the average for November. The highest barometer, 30.470 inches, occurred on the 22d at North Lewisburg, and the lowest, 29.553 inches, on the 2d at Sandusky. The mean temperature of the northern section was 42°.2; of the middle section, 43°.5; of the southern section, 46°.0, and of the State, 43°.9. These means are 2°.3, 3°.1, 3°.1 and 2°.8 above the average for the sections and the State, and are the highest mean temperatures recorded since the opening of the Bureau for November. The maximum temperature for the month, 76°.5, occurred on the 17th at Portsmouth and the minimum, 17°.0, on the 28th at Wauseon. The mean daily range of temperature was 17°. The greatest daily range was 44°.0 at Hanging Rock on the 5th, and the least, 3°, on the 8th at Columbus and Cleveland, and on the 27th at New Alexandria and Jefferson. The mean relative humidity, 80.1 per cent., was normal. The precipitation was deficient in all sections. This deficiency amounted to 0.08 inch in the northern section; 0.74 inch in the middle; 0.70 inch in the southern, and 0.51 inch in the State. The mean rainfall in the northern section was 2.75 inches; in the middle, 2.40 inches; in the southern, 2.44 inches, and in the State, 2.53 inches. Precipitation, in the form of rain or snow, was general over the State on the 2d, 8th, 9th,

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU

Date.	Lowest temperature.	Date.	Range of temperature	Mean daily range of temperature	Greatest daily range of temperature.	Date	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rain all.	Total rainfall for month	Average daily rainfall.	Direction of wind.
17th.	7.0	29th.	45.0	25.7	32.0	5th	6.0	26th	8	10	12	10	2.65	.088	S.
7th.	22.0	28th	47.0	16.4	30.5	5th.	8.0	.....	10	8	12	7	2.27	.076	S.W.
7th.	21.5	28th	43.5	14.9	28.5	5th.	5.0	.....	8	14	8	7	2.50	.083	W.
6th.	23.5	28th.	41.8	16.0	28.5	5th.	7.0	27th	7	7	16	4	2.62	.087	N. W.
17th.	23.0	28th.	44.0	16.9	31.0	5th.	6.0	30th.	8	9	13	12	1.86	.062	W.
7th	19.0	28th	48.0	17.8	31.7	5th.	8.0	27th	11	8	11	7	2.72	.091	S.W.
7th.	17.0	28th.	52.2	19.0	36.6	5th.	6.5	27th.	6	12	12	11	2.25	.075	N. W.
17th.	21.0	28th	48.3	17.3	32.4	5th.	4.7	16th	10	7	13	9	2.91	.097	W.
21st.	20.9	28th	47.8	16.4	32.9	21st.	4.3	16th.	6	12	12	10	2.85	.095	S.W.
.....	23.0	28th	44.0	18.3	38.0	5th.	7.0	.....	11	6	13	9	3.30	.110	S.W.
7th.	20.3	28th	45.0	17.7	31.5	21st	7.0	30th.	9	7	14	5	3.52	.117	S.W.
7th.	25.0	28th	43.0	15.0	29.0	21st.	7.0	16th.	10	8	12	8	2.27	.075	S.W.
7th	25.3	28th.	44.7	11.2	32.0	21st.	4.0	.....	8	7	15	14	2.55	.085	S.W.
.....	22.0	29th	53.0	23.3	44.0	5th.	5.0	12th.	4	14	12	7	2.46	.082	W.
17th.	24.0	28th	52.5	20.2	36.5	6th.	4.5	12th.	10	8	12	5	2.04	.068	S.W.
17th.	25.5	29th.	49.5	18.8	39.5	5th.	6.5	16th.	10	7	13	8	2.34	.078	S.W.
7th.	23.0	28th.	49.0	18.6	37.0	5th.	6.0	.....	11	4	15	10	3.14	.105	S.
17th.	24.0	28th	46.0	14.6	32.0	5th.	3.0	8th.	9	6	15	12	1.97	.066	S.
17th.	20.0	28th.	51.0	18.6	35.0	5th.	6.0	.....	5	10	15	12	1.76	.059	S.
7th.	21.0	28th.	47.0	15.7	31.0	5th.	5.5	.....	9	7	14	10	2.11	.070	S.
7th.	20.0	29th.	54.0	22.6	43.5	5th.	6.0	.....	5	13	12	6	2.31	.077	N. E.
17th	26.0	28th	41.0	13.7	32.0	2 st.	4.0	27th	9	6	15	9	2.86	.095	W.
17th.	25.0	29th.	49.0	17.0	32.8	5th	7.0	.....	3	15	12	7	2.56	.085	S.W.
17th.	29.0	29th	53.3	19.3	37.1	5th.	3.9	27th	6	11	13	7	3.08	.103	S.
9th.	21.0	29th	52.0	22.0	37.0	5th.	8.0	27th.	10	6	14	4	1.04	.035	W.
17th.	19.5	.....	55.5	19.7	35.0	21st.	7.0	.....	4	10	16	6	2.58	.086	S.W.
17th.	20.0	29th	49.5	19.4	35.0	21st.	4.0	11th	9	8	13	9	1.53	.051	W.
7th.	21.0	28th	48.0	15.1	29.0	21st.	3.0	27th.	10	8	12	8	1.83	.061	S
17th	23.8	28th	42.8	14.9	30.6	21st.	4.0	26th	10	5	15	10	2.43	.081	S.
6th.	21.0	28th	46.0	18.1	38.0	21st.	6.1	27th.	7	11	12	10	2.71	.090	S
17th	19.0	28th	45.4	14.8	29.2	5th.	4.8	26th	6	10	14	10	3.27	.109	S.W.
17th	22.6	28th	42.0	13.5	28.0	21st.	3.0	27th	8	7	15	12	2.4	.08	S W
.....	21.0	29th	42.0	16.8	34.5	21st	5.0	.....	10	8	12	8	2.61	.087	S.W.
17th.	28.0	27th	40.0	11.6	32.0	21st	3.0	8th	8	7	15	16	3.04	.101	S.W.
17th.	28.0	27th	39.5	13.2	31.5	21st.	4.0	11th.	5	7	18	14	2.14	.071	S.
17th.	29.0	28th	40.1	14.5	30.0	21st.	4.7	3d.	5	9	16	11	3.26	.109	N. W
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	3.54	[illegible]	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	3.19	[illegible]	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	2.72	[illegible]	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	2.19	.073	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	2.31	[illegible]	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	2.35	.078	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	2.20	.072	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	2.19	.106	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	2.6	.087	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.45	.082	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	1.70	[illegible]	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	2.20	.073	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	2.00	.067	.....
17th	17.0	28th	59.5	17.0	41.0	6th.	3.0	8th.	8.0	8.7	13.0	8.8	2.43	.081	S. W.

16th, 11th, 12th, 15th, 16th, 17th and 27th and local on the 1st 3d 4th, 7th, 18th, 19th, 20th, 26th and 28th. Snow was reported on the 1st, 2d 3d, 4th, 19th 20th, 26th, 27th 28th, 2 th and 29th. The total depth of snow for the month ranged from a trace at Pomeroy to 3.5 inches at Jefferson. Nineteen stations reported an inch or more of precipitation in twenty four consecutive hours during the month The heaviest reported was 2.81 inches at Leipsic on the 16th and 17th. The highest wind velocities reported during the month were 52 miles S. W. at Cleveland and 29 miles S. at Toledo on the 9th; 35 miles S. at Columbus, and 46 miles S. W. at Toledo on the 1st; 32 miles S. W. at Sandusky on the 2d, and 48 miles S. W. at Ohio State University on the 17th. The greatest daily movement was 500 miles on the 1st at Ohio State University and the least 46 miles at Toledo, date not given Total movement Cincinnati, 5,596 miles; Columbus, 5,810 miles; Cleveland, 7,079 miles; Toledo, 6,275 miles, Sandusky 6,637 miles, and O. S. University, 6,683 miles. The percentage of verifications of weather forecasts received from Washington, computed from reports of observers, was 92 for weather and 98 for temperature.

C. E. KILBOURNE, *by O. M. Duncan.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF DECEMBER, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati	.....	.....	30.154	30.475	13th	29.682	3d.	.793	71.8	35.8	56.0
Dayton	0.42	0.84	30.141	30.482	19th	29.666	3d.	.816	83.6	32.7	53.0
Greenville	.....	.....	30.088	30.394	19th	29.666	3d.	.728	90.7	30.5	49.0
Celina	.....	.....	30.140	30.477	19th.	29.686	10th	.791	77.2	33.8	59.0
Upper Sandusky	3.71	3.29	30.115	30.515	19th	29.646	10th.	.869	93.5	30.6	47.0
Findlay	.....	.....	30.111	30.419	25th	29.627	10th.	.892	84.8	29.8	50.5
Wauseon	2.09	1.90	30.127	30.519	25th.	29.627	10th.	.892	78.2	27.6	50.1
Clarksville	3.87	3.93	30.161	30.496	13th.	29.686	3d.	.810	76.0	31.4	51.5
North Lewisburg	0.61	0.61	30.141	30.527	19th.	29.681	3d.	.846	80.6	30.6	53.0
Bangorville	.....	.....	28.613	29.005	19th	28.158	3d.	.847	64.5	28.5	41.5
Toledo	.....	.....	30.116	30.524	25th	29.605	10th.	.919	77.6	28.5	51.0
Sandusky	0.52	0.78	30.092	30.500	25th	29.601	10th	.899	76.2	30.5	53.0
Hanging Rock	0.13	0.42	30.142	30.513	13th	29.635	3d.	.878	91.5	33.8	57.0
Portsmouth	.....	.....	30.140	30.479	13th	29.673	3d	.806	81.1	35.9	65.0
Waverly	.....	.....	30.132	30.509	19th	29.613	3d.	.864	77.1	33.7	56.5
Georgetown	.....	.....	30.145	30.474	13th.	29.717	3d.	.757	82.3	34.4	56.0
Columbus	.....	.....	30.139	30.486	19th	29.664	3d.	.822	75.0	31.8	53.0
O. S. University	.....	.....	30.115	30.487	19th.	29.657	3d.	.830	78.1	30.7	53.0
Westerville	0.74	0.74	30.100	30.460	19th.	29.640	3d.	.820	85.0	31.3	52.0
Logan	.....	.....	30.130	30.503	19th.	29.617	3d	.886	91.0	32.2	56.0
Oberlin	.....	.....	30.120	30.543	25th.	29.606	10th.	.937	71.0	29.3	50.0
Marietta	.....	.....	30.115	30.548	19th.	29.609	3d.	.939	80.6	34.6	55.3
McConnelsville	.....	.....	30.116	30.529	19th	29.667	3d.	.862	88.4	31.5	52.1
Pomeroy	.....	.....	30.170	30.510	19th	29.758	3d.	.752	94.7	33.8	55.0
Athens	.....	.....	30.163	30.543	19th.	29.698	3d.	.845	82.7	31.8	54.5
Newcomerstown	.....	.....	30.109	30.528	19th.	29.587	3d.	.941	85.3	29.8	49.0
New Alexandria	.....	.....	.....	.....	.....	.....	.....	.....	78.2	30.0	47.0
Canton	.....	.....	30.105	30.535	19th.	29.650	3d.	.885	.....	29.3	47.0
Youngstown	0.93	0.93	30.086	30.496	19th.	29.591	3d.	.905	83.2	29.8	47.0
Hiram	.....	.....	30.106	30.551	19th.	29.581	3d.	.970	88.1	26.7	45.2
Wooster	.....	.....	30.134	30.568	19th	29.656	3d.	.912	79.1	28.8	48.0
Cleveland (S. O.)	.....	.....	30.112	30.538	25th.	29.638	10th.	.900	74.2	30.0	50.0
Cleveland (Hyde)	.....	.....	.....	.....	.....	.....	.....	.....	.....	30.7	50.0
Akron	0.00	0.00	30.098	30.522	19th.	29.613	10th.	.909	86.8	29.4	47.4
Hudson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weymouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellsworth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lordstown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellevue	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garrettsville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vienna	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kenton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waynesville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springboro	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jacksonburg	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Circleville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Milton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State	.....	.....	30.125	30.568	19th.	29.581	3d.	.987	79.1	31.2	65.0

The mean atmospheric pressure, 30.125 inches, was .015 inch below the average. The highest barometer, 30.568 inches, occurred at Wooster on the 19th, and the lowest, 29.581 inches, at Hiram on the 3d. The mean temperature of the northern section was 29°.3; of the middle section, 30°.8; of the southern section, 33°.6, and of the State, 31°.2. These means are 1°.3, 0°.6, 0°.9 and 0°.9 below the average for the sections and State respectively. The maximum temperature was 65°.0, on the 11th at Portsmouth, and the minimum, 3°.0, on the 30th at Newcomerstown. The mean daily range of temperature was 14°.5. The greatest daily range was 38°.3, on the 30th at McConnelsville, and the least, 1°.0, on the 17th at New Alexandria. The mean relative humidity, 79.1 per cent., was below normal. The mean rainfall in the northern section was 2.04 inches; in the middle, 2.27 inches; in the southern, 2.81 inches, and in the State, 2.37 inches. The precipitation was deficient in the northern and middle sections, 0.36 and 0.31 inch respectively, and in excess in the southern section 0.13 inch. The precipitation was deficient 0.18 inch in the State. Precipitation was general over the State on the 3d, 8th, 16th, 17th, 21st, 26th, 27th and 31st, and local on the 4th, 12th, 18th, 20th and 28th. Rain or snow fell generally over the northern and middle sections on the 1st, and the middle and

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Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rain fall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
21st.	16.0	28th	40.0	14.1	28.0	30th.	6.0	12th.	4	15	12	13	1.83	.061	N. W.
21st.	12.5	28th	40.5	13.6	28.0	30th.	6.0	.....	12	9	10	6	1.13	.038	N. W.
.....	11.0	28th	38.0	12.7	24.0	.....	3.5	25th.	6	15	10	5	1.01	.033	N. W.
22d.	17.5	28th	41.5	16.0	25.0	22d.	7.0	17th.	5	12	14	6	0.91	.029	N. W.
.....	11.0	9th.	36.0	14.3	28.0	15th	7.0	25th	4	11	16	10	1.11	.036	S. W.
21st.	11.0	9th.	39.5	14.2	30.0	30th	5.0	17th.	8	10	13	7	2.11	.068	S. W.
21st.	5.5	8th.	44.6	16.3	32.0	30th.	5.0	17th.	5	12	14	9	1.16	.037	S. W.
21st.	6.0	28th.	48.5	14.5	29.0	30th.	3.6	25th.	10	12	9	11	2.13	.069	W.
21st.	10.0	30th	43.0	15.2	35.0	30th.	4.0	25th.	9	14	8	7	1.85	.060	S. W.
22d.	9.5	30th	35.0	15.6	28.7	30th	5.5	17th.	7	8	12	8	1.92	.062	S. W.
21st.	13.0	28th	38.0	13.9	25.0	30th	5.0	31st.	10	5	16	9	1.04	.034	S. W.
21st.	12.0	28th.	41.0	11.9	27.0	30th	4.0	26th.	2	10	19	10	0.96	.031	W.
11th.	12.0	28th.	45.0	19.8	35.0	15th.	5.0	17th.	6	12	13	10	4.38	.141	E.
11th.	16.0	28th	49.0	16.7	31.0	11th.	3.0	17th.	12	6	13	10	3.60	.116	S. W.
21st.	13.0	30th.	43.5	17.6	34.5	15th.	5.5	.....	7	11	13	11	3.42	.110	S. W.
21st.	9.0	28th	47.0	17.4	32.0	15th	5.5	7th.	8	10	13	10	2.86	.092	N. W.
22d.	14.0	9th.	39.0	10.9	29.0	30th	3.0	17th	7	12	12	11	2.19	.071	S.
21st.	6.5	30th.	46.5	14.3	32.5	30th	2.0	17th	11	8	12	11	2.38	.077	S.
21st.	6.5	30th	45.5	13.1	32.5	30th.	2.5	4th.	9	12	10	8	1.92	.062	S.
21st.	7.0	30th.	49.0	17.7	35.0	15th.	4.0	.....	8	12	11	9	3.19	.103	S. E.
21st.	11.0	28th	39.0	13.6	27.0	.....	3.0	17th.	7	13	11	9	1.73	.056	W.
11th.	16.5	30th.	48.8	14.3	36.5	30th.	5.3	.....	3	13	15	12	5.68	.183	S. W.
21st.	8.1	30th.	44.0	17.2	38.3	30th	5.0	8th.	5	8	18	10	3.68	.119	S.
11th.	16.0	.....	39.0	16.3	29.0	20th	4.0	.....	10	7	14	10	2.34	.075	W.
23d.	8.5	30th	46.0	18.5	34.9	30th	8.0	.....	.....	.....	.....	.....	.....	.....	.....
21st.	3.1	30th.	46.0	15.0	34.0	30th	5.0	8th.	6	9	16	9	2.71	.087	W.
11th.	10.0	.....	37.0	12.1	26.0	30th	1.0	17th	7	8	16	14	3.86	.....	S. W.
21st.	5.8	30th.	41.2	12.6	32.0	30th.	4.7	25th.	6	11	14	16	1.91	.062	W.
.....	9.0	30th.	38.0	14.0	27.2	20th	4.6	6th.	4	9	18	10	3.02	.097	S.
22d.	13.3	8th.	31.9	11.8	22.5	30th.	4.5	24th	5	10	16	11	2.35	.076	S. W.
21st.	15.0	9th.	33.0	13.0	22.0	15th	5.0	17th.	7	7	17	12	1.74	.056	.....
21st.	14.0	30th	36.0	10.1	26.0	30th	3.0	2d.	3	8	20	12	1.75	.056	S. W.
21st.	14.4	30th.	35.6	11.1	25.6	30th.	4.0	25th	4	6	21	12	1.80	.058	S.
21st.	13.4	28th.	34.0	12.0	21.6	30th.	4.5	25th	2	13	16	13	2.48	.080	S. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.69	.087	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.90	.094	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.54	.082	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.82	.059	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.52	.081	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.03	.033	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.35	.044	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.31	.107	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.19	.101	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.14	.037	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.98	.064	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.73	.056	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	.048	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.70	.067	.....
11th.	3.0	30th.	62.0	14.5	38.3	30th.	1.0	17th.	6.7	10.3	14.0	10.0	2.37	.076	S. W.

southern sections on the 6th and 25th. Local rains or snow also occurred in the northern section on the 2d, 7th, 9th, 10th, 11th 24th and 29th. The total monthly snowfall averaged between 10 and 20 inches in the different sections. The greatest in twenty-four consecutive hours occurred on the 25th and 26th, when from 6 to 10 inches fell in the central eastern and southern portions of the State. A very dense fog and mist prevailed over the State on the 30th. The highest wind velocities reported during the month were 37 miles S. W. at Cleveland on the 13th; 48 miles W. at Ohio State University on the 17th; 38 miles W. at Columbus, and 40 miles W. at Toledo on the 23d, and 32 miles S. W. at Cincinnati, and 45 miles N. W. at Sandusky on the 27th. The greatest daily movement was 726 miles at the Ohio State University on the 17th, and the least, 74 miles, at Cincinnati and Toledo, date not given. Total movement: Cincinnati, 6,517 miles; Columbus, 6,630 miles; Cleveland, 7 731 miles; Toledo, 7,201 miles; O. S. University, 9,474 miles, and Sandusky, 7,991 miles. The percentage of verifications of weather forecasts received from Washington, computed from reports of observers, was 89 for weather and for 89 temperature.

C. E. KILBOURNE, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JANUARY, 1891, FURNISHED

Stations	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati	.....	.....	30.11	30.65	8th.	29.29	1st.	1.36	77	36	62
Dayton	.....	.....	30.07	30.70	8th.	29.26	1st.	1.44	83	34	58
Wapakoneta	.....	.....	30.07	30.61	7th.	29.39	1st.	1.32	85	31	56
Greenville	.....	.....	30.06	30.62	8th.	29.30	1st.	1.32	91	31	55
Celina	.....	.....	30.11	30.72	8th.	29.23	1st.	1.49	81	34	57
Upper Sandusky	4.00	3.61	30.08	30.72	8th.	29.25	1st.	1.47	94	32	51
Findlay	.....	.....	30.09	30.73	8th.	29.20	1st.	1.53	90	30	54
Tiffin	.....	.....	30.04	30.67	8th.	29.16	1st	1.51	.....	31	55
Wauseon	2.56	2.07	30.10	30.74	8th.	29.20	1st.	1.51	83	28	53
Clarksville	4.12	4.59	30.12	30.68	8th.	29.32	1st.	1.36	84	33	58
North Lewisburg	.....	.....	30.12	30.69	8th.	29.30	1st.	1.39	82	31	53
Bangorville	.....	.....	30.14	30.71	8th.	29.43	1st.	1.28	75	30	52
Toledo	.....	.....	30.09	30.69	8th.	29.21	1st.	1.48	81	29	54
Sandusky	0.55	0.68	30.07	30.67	8th.	29.18	1st.	1.49	83	31	56
Hanging Rock	0.09	0.32	30.14	30.71	8th.	29.35	11th.	1.36	90	36	64
Portsmouth	.....	.....	30.10	30.65	8th	29.30	11th.	1.35	85	38	63
Waverly	.....	.....	30.10	30.67	8th.	29.29	11th.	1.38	81	36	64
Georgetown	.....	.....	30.12	30.65	8th.	29.34	1st.	1.31	88	35	59
Columbus	.....	.....	30.11	30.67	8th.	29.29	1st.	1.38	80	33	57
O. S. University	.....	.....	30.09	30.69	8th.	29.31	1st.	1.38	84	32	57
Westerville	0.61	0.58	30.07	30.66	8th.	29.29	1st.	1.37	88	33	55
Logan	.....	.....	30.10	30.71	8th.	29.35	11th.	1.36	87	35	61
Oberlin	.....	.....	30.08	30.71	8th.	29.39	11th.	1.32	75	30	53
Marietta	.....	.....	30.12	30.66	8th.	29.29	11th.	1.37	84	37	60
Pomeroy	.....	.....	30.13	30.68	8th.	29.29	11th.	1.39	90	36	60
Athens	.....	.....	30.13	30.71	8th.	29.30	11th.	1.41	88	35	65
Granville	.....	.....	30.04	30.65	8th.	29.37	11th.	1.28	91	31	55
Newcomerstown	.....	.....	30.08	30.68	8th.	29.33	1st.	1.35	89	32	55
New Alexandria	.....	.....	.....	.....	..	.....	.....	.....	84	32	52
Canton	.....	.....	30.08	30.69	8th.	29.32	1st.	1.37	.....	32	56
Youngstown	.....	.....	30.03	30.56	8th.	29.32	11th.	1.24	87	32	53
Hiram	.....	.....	30.08	30.69	8th.	29.32	1st.	1.37	94	29	50
Wooster	.....	.....	30.11	30.71	8th.	29.33	1st.	1.38	89	30	51
Cleveland (S. O.)	.....	.....	30.09	30.69	8th.	29.24	1st.	1.45	81	31	54
Cleveland (Hyde)	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	57
Akron	.....	.....	30.07	30.68	8th.	29.31	1st.	1.37	90	31	52
Hudson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weymouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellsworth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lordstown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellevue	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garrettsville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Orangeville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leipsic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kenton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gratiot	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Demos	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State	.....	.....	30.09	30.74	8th	29.16	1st.	1.58	85	33	65

The mean atmospheric pressure, 30.09 inches, was .05 inch below the average. The highest barometer, 30.74 inches, occurred at Wauseon on the 8th. and the lowest, 29.16 inches, at Tiffin on the 1st. The mean temperature of the northern section was 31°; of the middle section, 32°. and of the southern section, 36°. These means are 6°, 5° and 6° above the nine-year average. The mean for the State, 33°, was 6° above the average. The warm periods of the month occurred on the 1st, 2d, 9th to 12th, and 18th to 31st, inclusive. The intermediate periods were only slightly below the average. The maximum temperature was 65°, on the 31st, at Athens. The minimum was 3° on the 8th at Wauseon, and is the highest minimum temperature recorded for January since the opening of the Bureau. The mean daily range 10°, is 7° below the average, and is the smallest on record for any month. The greatest daily range was 39°. on the 1st, at Upper Sandusky, and the 3d, at Celina, and the least, 2°, on the 4th, at Canton, and the 11th, at Cleveland (Hyde). The range between day and night temperatures for the month was very small. The mean relative humidity, 85 per cent. was 2 per cent. above the normal. The mean precipitation in the northern section was 2.08 inches; in the middle, 2.92 inches; in the southern, 3.47 inches, and in the State, 2.82 inches. These means are .59 inch, .62 inch, .25 inch and .49 inch below the average for the sections and State respectively. Precipitation was general over the State on the 1st, 2d, 10th, 11th, 21st, 22d, 28th, 29th and 31st, and gen-

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Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days	Days on which rain fell, with 0.1 rainfall	Total rain fall for month	Average daily rain fall.	Direction of wind.
29th.	18	17th	41	12	25	20th.	6	31.	7	7	17	15	3.31	.11	S.
.....	15	.....	43	13	25	2d.	7	11th	4	10	17	8	3.17	.10	S. W.
1st.	10	.....	36	14	24	.....	3	1 th	5	8	18	8	3.02	.10	S. W.
29th	10	15th	45	12	25	15th.	3	23d.	2	10	19	9	3.18	.10	S. W.
.....	15	7th	42	16	39	3d.	8	.....	4	7	20	9	2.28	.07	S.
.....	12	.....	39	11	39	1st	1	19th	1	13	17	11	1.68	.05	S. W.
.....	5	7th	49	13	32	2d.	3	11th.	1	14	16	12	2.43	.08	S. W.
1st.	13	.....	42	12	31	2d.	4	21st	4	8	19	12	1.93	.06	S.
1st.	3	8th.	50	14	30	2d.	4	18th	1	11	19	13	2.56	.08	S. W.
.....	15	15th	43	12	25	.....	4	.....	5	8	18	12	3.61	.12	W.
.....	9	7th.	46	15	31	15th	6	18th.	3	11	17	11	3.50	.11	S. W.
29th.	9	7th.	43	14	31	2d.	6	12th.	1	9	21	10	2.53	.08	S. W.
1st.	12	7th.	42	11	19	8th.	4	.....	3	8	20	12	1.68	.04	N.W.
1st.	14	7th.	42	11	22	.....	4	16th.	.....	4	27	17	2.00	.06	W.
29th	14	7th.	50	17	33	.....	4	.....	5	6	20	9	3.59	.12	S. W.
29th.	18	7th.	45	14	28	27th.	5	13th	6	10	15	11	3.30	.11	S. W.
27th.	12	7th.	52	16	38	27th	5	17th	5	5	21	13	3.97	.13	S. W.
27th.	13	8th	46	13	30	29th.	3	12th.	4	6	21	11	4.76	.15	S. W
29th.	17	7th.	40	10	21	20th.	3	12th	3	7	21	12	2.84	.09	S.
29th.	13	7th.	44	12	30	2d.	3	18th.	4	9	18	11	3.13	.10	S. W.
29th.	14	7th.	41	12	29	2d.	5	18th	3	9	19	11	3.11	.10	S.
27th.	13	7th	48	15	35	27th	3	3d	4	6	21	9	3.97	.13	S. E.
29th.	12	17th.	41	13	30	2d.	4	11th.	1	11	19	6	1.88	.06	W.
.....	20	7th.	40	14	29	27th.	6	4th	.....	10	21	10	3.84	.12	S.
.....	11	8th.	49	14	35	27th	6	17th.	8	4	19	8	2.84	.09	W
31st	14	.....	51	18	36	11th.	5	18th.	1	9	21	5	3.13	.10	S.
29th.	6	3d.	48	15	33	15th.	4	22d.	10	18	3	8	3.05	.10	S. W.
29th.	10	15th.	45	13	29	2d.	4	4th.	2	6	23	11	3.09	.10	W.
29th.	14	8th.	38	12	19	.....	3	23d.	3	5	23	11	3.86	.12	S.
1st.	16	.....	40	11	30	2d.	2	4th.	1	10	20	14	2.19	.07	S.
27th.	13	8th.	40	13	25	.....	6	20th	2	8	21	11	2.41	.08	N.
29th.	11	13th.	39	11	25	27th.	4	.....	1	8	22	14	2.44	.08	N.W.
29th.	12	13th	39	11	24	15th.	4	11th.	.....	10	21	12	2.74	.09	N.W.
1st.	18	.....	36	9	23	27th.	3	3d.	3	3	25	14	2.14	.07	S. W.
27th.	16	18th	41	11	29	27th	2	11th.	1	5	25	15	2.56	.08	S.
2d	15	13th	37	12	31	2d.	5	4th.	.....	8	23	16	2.04	.07	S. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.70	.06	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.95	.06	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.71	.06	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.67	.09	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.17	.07	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.08	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.50	.08	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.05	.07	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.90	.06	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.43	.08	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.88	.09	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.93	.09	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.37	.08	.....
31st	8	8th	62	10	39	1st	2	4th	3	8	20	11	2.82	.09	S. W.

eral in the middle and southern sections on the 9th. Local precipitation occurred in all sections on the 3d, 4th, 5th, 6th, 13th and 23d; in the northern section on the 7th and 26th, and the northern and middle sections on the 30th. The greatest monthly precipitation was 4.76 inches at Georgetown, and the least, 1.00 inch, at Bellevue. Thunder-storms occurred at Waverly, on the 1st; Pomeroy on the 11th, and Sandusky, Youngstown, Akron, Weymouth, Ellsworth, Lordstown, Garrettsville and Orangeville on the 29th. Lightning was reported from Canton, Wooster, Cleveland (S. O.), Bangorville, Newcomerstown and Demos on the 29th. The total snowfall for the month ranged from a trace at Hanging Rock to 15 inches at Greenville and Findlay. No snow remained on the ground at the end of the month. The highest wind velocities reported during the month were 27 miles S. at Cincinnati; 34 miles S. W. at Columbus, and 52 miles S. W. at Ohio State University on the 2d; 30 miles S. W. at Cleveland on the 13th, and 40 miles S. W. at Toledo, and 33 miles W. at Sandusky on the 29th. Total monthly movement: Cincinnati 5,6-7 miles; Columbus, 5,109 miles; Cleveland, 5,883 miles; Toledo 5,630 miles; O. S. University 6,841 miles and Sandusky, 5,979 miles. The prevailing direction of the wind was southwest. The percentage of verifications of weather forecasts received from Washington, computed from reports of observers, was 83 for weather and 81 for temperature.

C. E. KILBOURNE, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF FEB., 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches.					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Departure mean from normal.	No. years record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.08	30.56	14th.	29.47	25th.	40	+3	20	72	20th.	4	4th.	48	32
Dayton	1.34	1.46	30.07	30.59	14th.	29.46	25th.	38	+6	9	69	20th.	1	4th.	48	29
Wapakoneta	.....	.....	30.05	30.59	28th.	29.48	25th.	34	+3	4	59	17th.	0	4th.	44	25
Greenville	.....	.....	30.05	30.50	14th.	29.45	25th.	34	+3	6	57	*1	1	4th.	43	27
Celina	.....	.....	30.08	30.58	14th.	29.50	25th.	37	+3	4	61	25th.	1	4th	46	29
Up'r Sandusky	4.89	4.78	30.05	30.54	14th.	29.46	25th.	35	+5	9	58	16th.	2	4th.	43	27
Findlay	.....	.....	30.08	30.58	*3	29.39	25th.	33	—1	3	58	16th.	2	4th.	43	25
Tiffin	.....	.....	30.04	30.58	*2	29.35	25th.	34	—1	2	58	16th.	6	4th.	43	28
Wauseon	3.77	3.77	30.05	30.58	14th	29.34	25th.	31	+5	22	57	25th	0	4th.	42	23
Clarksville	2.71	2.78	30.09	30.58	14th	29.48	25th.	37	+2	5	71	20th	4	4th.	4[illegible]	29
No. Lewisburg	.....	.....	30.09	30.62	14th.	29.46	25th.	35	+4	9	68	20th	1	4th.	46	26
Bangorville	.....	.....	30.08	30.61	14th	29.44	25th.	33	+3	4	66	20th	1	4th	44	24
Toledo	.....	.....	30.05	30.58	14th	29.38	25th.	32	+4	.....	56	24th.	4	4th.	39	26
Sandusky	0.50	1.68	30.04	30.58	14th	29.32	25th	34	+6	....	58	*7	6	4th.	42	27
Hanging Rock	0.25	0.82	30.09	30.57	4th.	29.45	25th.	41	+5	8	76	20th.	12	5th.	53	31
Portsmouth	.....	.....	30.06	30.51	28th.	29.50	7th.	42	+5	7	80	20th.	10	4th.	54	33
Waverly	.....	.....	30.07	30.59	14th	29.46	25th.	39	+4	7	76	20th.	7	4th.	51	29
Georgetown	.....	.....	30.09	30.55	4th.	29.47	25th.	39	+3	6	70	20th	5	4th.	49	30
Columbus	.....	.....	30.08	30.55	14th.	29.48	25th	37	+5	12	60	20th	5	4th.	44	30
O. S. University	.....	.....	30.06	30.56	14th.	29.43	25th.	36	+5	9	69	20th.	6	4th.	46	28
Westerville	2.11	2.10	30.04	30.54	14th.	29.50	7th.	36	+5	16	64	20th.	5	4th	45	28
Logan	.....	.....	30.10	30.58	14th.	29.39	25th	38	+4	8	75	20th	5	4th.	49	28
Oberlin	.....	.....	30.05	30.61	14th.	29.37	25th.	33	+5	9	57	20th	5	4th	43	26
Marietta	.....	.....	30.09	30.61	14th.	29.56	25th.	41	+5	9	72	20th.	11	4th.	53	33
McConnelsville	.....	.....	30.07	30.61	14th	29.44	25th	39	+6	7	72	20th.	6	4th.	48	29
Pomeroy	.....	.....	30.09	30.57	14th	29.48	7th.	41	+4	7	73	20th	9	*12	52	30
Athens	.....	.....	30.10	30.61	14th	9.50	25th.	39	+2	3	74	20th.	7	4th	49	25
Granville	.....	.....	30.08	30.58	14th.	29.62	7th	35	+5	7	61	17th.	-2	5th.	44	26
Newcomersto'n	.....	.....	30.06	30.61	14th	29.35	25th	37	+3	5	66	*13	6	4th.	46	26
N. Alexandria	.....	.....	....	.....	.....	.....	.....	38	+5	6	63	20th.	4	4th.	46	28
Canton	.....	.....	30.05	30.58	14th	29.41	25th.	35	+6	9	64	21st	4	4th	44	27
Youngstown	.....	.....	30.03	30.61	14th.	29.44	25th.	36	+5	6	66	*15	6	*12	48	28
Hiram	.....	.....	30.05	30.58	14th	29.40	25th.	32	+6	7	61	20th	2	4th.	41	24
Wooster	3.25	3.96	30.07	30.61	14th.	29.39	25th.	34	+5	7	60	20th.	3	4th.	43	26
Cleveland (S. O.)	.....	.....	30.06	30.62	14th.	29.35	25th.	34	+6	21	62	20th.	7	5th	41	27
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	34	+5	8	59	20th.	7	5th.	43	27
Akron	0.00	0.00	30.04	30.57	14th.	29.40	25th.	34	+3	4	60	20th	5	4th.	41	27
State—Mean	.....	.....	30.07	30.58	.....	29.44	.....	36	+5	9	65	.....	5	.....	46	28
Highest	.....	.....	30.10	30.62	14th.	29.62	.....	42	+6	.....	80	20th.	12	.....	54	33
Lowest	.....	.....	30.03	30.50	.....	29.32	25th.	31	—1	.....	56	.....	-2	5th.	39	23
Range	.....	.....	0.07	0.12	.....	0.30	.....	11	7	.....	24	.....	14	.....	15	

*27 days only, barometer. T.—Trace. *1—16th, 17th and 20th. *2—3d and 18th. *3—14th and 28th. *9—17th and 19th. *10—15th and 19th. *11—19th and 21st *12—4th and 5th. *13—20th and 21st.

The mean atmospheric pressure, 30.07 inches, was .05 inch below the average. The highest barometer, 30.62 inches, occurred at North Lewisburg and Cleveland (S.O.) on the 14th, and the lowest, 29.32 inches, at Sandusky on the 25th. The mean temperature of the northern section was 34°; of the middle section, 36°, and of the southern section, 39° and of the State, 36°. These means are 6°, 6°, 5° and 5° above the averages of the sections and State respectively. During the month 19 days were above the normal, 1 was normal, and 8 were below the normal temperature. The maximum temperature, 80°, occurred at Portsmouth on the 20th, and is the highest maximum on record for February. The minimum temperature, 2° below zero, occurred at Granville on the 5th. The mean of maximum temperatures for the month was 46°, and of minimum, 28°. The mean daily range of temperature was 18°. The greatest daily range was 44°, on the 20th, at Hanging Rock, and the least, 3°, on the 8th, at Findlay and Columbus; on the 10th, at Cleveland, and on the 19th, at Sandusky. The mean relative humidity, 82 per cent., was normal. During the month of February the precipitation was in excess in all sections. Precipitation was general on the 1st, 3d, 7th, 9th, 15th, 16th, 17th, 20th, 21st, 24th, 25th, and 28th; also, in the northern section on the 26th, and the southern on the 19th. Local precipitation occurred in all sections on the 2d, 4th, 8th, 10th, 18th, 19th, 22d, 26th and 27th; also, in the middle on the 23d, and the southern on the 12th and 13th. The mean precipitation for the northern section was 4.50 inches; for the middle section, 5.00 inches, and for the State, 4.91 inches. These means are 1.00 inch, 2.27 inches, .65 inch, and .97 inch above the averages for the

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Fahrenheit. Daily range. Mean.	Greatest.	Date.	Least.	Date.	Relative humidity.	Precipitation—In inches. Total for month, including melted snow.	Departure from normal.	Normal.	No. years record.	Average daily.	Greatest in 24 consec. hours.	Snowfall. Total for month.	On gr'nd at end of month.	No. days which .01 inch or more fell.	Number of days. Clear.	Fair.	Cloudy.	Prevailing direction of wind.
16	38	20th.	6	18th.	74	3.87	+0.05	3.82	20	.14	1.18	0.1	.....	13	5	9	14	S.
19	36	20th.	7	7th.	80	4.41	+0.84	3.57	9	.16	1.00	1.0	1.0	10	7	10	11	S. W.
19	39	3d.	5	8th.	90	2.91	—0.29	3.20	4	.10	1.75	1.5	1.0	5	7	11	10	N. W.
16	33	3d.	4	8th.	90	4.26	+1.28	2.98	6	.15	1.17	2.0	2.0	10	4	11	13	S
17	33	25th	7	8th	80	4.13	+1.33	2.80	4	.15	1.90	1.0	1.0	7	4	10	14	N. W.
16	31	*2	3	19th.	94	3.13	—0.78	3.91	9	.11	.65	2.7	1.3	15	5	11	12	W.
18	39	3d.	3	8th.	88	4.19	—1.68	5.87	3	.15	2.12	2.0	2.0	9	5	13	10	S. W.
16	36	3d.	4	*4	81	4.19	—0.03	4.22	2	.15	1.09	2.4	1.0	15	4	13	11	S.
19	38	3d.	7	8th.	79	4.58	+1.70	2.88	18	.16	1.58	4.1	1.5	17	1	12	15	S. W.
18	38	*5	4	17th	79	5.81	+1.66	4.15	5	.21	2.26	0.2	T	12	5	12	11	N. W.
20	37	20th	4	8th.	79	5.25	+1.26	3.99	9	.19	1.90	2.0	2.0	11	6	11	11	S.
20	38	20th.	8	7th.	73	6.14	+2.31	3.83	4	.22	1.58	2.0	2.0	13	4	12	12	S. W.
13	31	15th.	4	*6	76	3.08	+1.00	2.08	.....	.11	1.50	3.0	1.0	15	3	10	15	N. W.
15	41	3d.	5	*8	76	4.05	+0.94	3.11	.	.14	1.24	3.5	2.0	14	.....	10	18	N. W.
22	44	20th	5	19th	88	5.20	+0.58	4.62	8	.19	1.85	1.4	.....	17	6	9	13	E.
20	41	20th	9	19th.	84	5.04	+0.61	4.43	7	.18	1.13	2.2	2.0	16	4	14	10	E.
23	42	20th.	8	19th.	81	3.59	—0.61	4.20	7	.13	.58	0.6	.....	16	6	12	10	N. W.
19	36	20th.	8	*9	87	3.67	—0.78	4.45	6	.13	.83	T	.....	13	1	5	22	N. W.
14	36	20th.	3	8th.	73	5.42	+1.82	3.60	12	.19	2.51	2.2	1.0	16	7	8	13	S.
18	36	20th.	5	8th.	79	4.80	+0.90	3.90	9	.17	2.00	2.1	1.0	14	9	7	12	S.
17	31	2d.	5	8th.	86	5.05	+2.19	2.86	16	.18	1.87	1.6	1.5	13	6	9	13	S.
21	42	20th.	5	8th.	89	6.59	+2.29	4.30	8	.24	1.55	2.0	2.0	11	6	11	11	S. E.
17	32	*10	4	8th.	81	4.35	+1.29	3.06	9	.16	1.06	2.5	2.0	8	2	12	14	W.
20	34	20th.	8	8th.	79	4.97	+0.80	4.17	9	.18	.85	0.5	.....	15	3	14	11	S.
19	39	20th.	6	*11	88	6.92	+3.15	3.77	7	.25	1.40	2.0	0.5	17	5	8	15	S.
22	39	20th.	8	19th	90	4.22	+0.28	3.94	7	.15	1.40	1.4	.....	13	12	4	12	W.
24	40	20th.	6	19th.	82	4.09	+0.34	3.75	3	.15	1.31	0.5	.....	12	6	11	11	N. W.
18	42	5th.	6	7th.	85	6.16	+2.11	4.05	7	.22	2.90	1.0	1.0	13	10	11	7	S. W.
20	38	20th.	9	*14	83	5.79	+1.36	4.43	5	.21	2.50	1.0	1.0	11	4	8	16	W.
17	32	20th	7	8th.	77	7.04	+2.85	4.19	6	.25	3.13	3.0	3.0	12	5	7	16	S. W.
17	31	20th	5	8th.	.....	3.85	+0.02	3.83	9	.14	.73	1.7	1.0	13	7	11	10	W.
20	34	*16	5	8th.	86	4.00	+0.64	3.36	6	.14	1.33	1.0	1.0	11	4	10	14	S.
17	32	*5	4	8th.	88	5.26	+1.59	3.67	7	.19	1.12	2.8	2.5	15	3	11	14	N. W.
17	29	20th.	4	8th.	81	4.83	+0.96	3.87	7	.17	.82	2.1	1.5	15	4	11	13	S.
14	33	3d.	3	10th.	.....	5.15	+2.30	2.85	21	.18	1.45	3.8	1.6	15	5	1	22	N. W.
16	36	3d.	4	10th.	.....	4.95	+1.47	3.48	8	.18	1.14	4.7	1.0	16	4	7	17	W.
17	34	3d.	4	8th.	87	3.26	+0.56	2.70	4	.12	.82	1.5	1.2	15	2	12	14	N. W.
18	36	.....	5	.....	82	4.91	+0.97	3.94	9	.18	.....	2.1	1.2	12	5	9	14	N. W.
24	44	20th.	9	.....	94	7.61	+3.15	5.87	.....	.27	3.13	5.0	3.0	17	15	15	22	.....
13	29	20th.	3	*17	73	2.91	—1.68	2.08	.....	.10	.58	T	T	5	.....	.....	7	.....
11	15	.....	6	.....	21	4.70	4.83	3.79	.....	.17	2.55	5.0	3.0	12	15	15	15	.....

*4—7th and 8th. *5—5th and 20th. *6—7th and 10th. *7—16th, 20th and 25th. *8—7th, 8th and 26th. *14—8th, 17th, 19th and 26th. *15—21st and 22d. *16—5th, 21st and 22d. *17—Findlay and Columbus, 8th; Cleveland, 10th; Upper Sandusky, 19th.

sections and State respectively. Destructive floods followed the heavy rainfalls of the 16th and 17th. The greatest damage being reported from the Ohio and Hocking Valleys on the 17th. The greatest precipitation in 24 consecutive hours, 3.13 inches, occurred at New Alexandria on the 16th; 40 stations reported one inch or more of precipitation in 24 hours. The greatest monthly precipitation was 7.61 inches, at Demos, and the least, 2.91 inches, at Wapakoneta The monthly snowfall averaged nearly two inches for the State, ranging from a trace at Georgetown to five inches at Weymouth. The heaviest occurred on the 28th inst., and was general over the State, leaving the ground covered with snow at nearly all reporting stations, at the close of the month. The highest wind velocities reported during the month were 30 miles S. at Cincinnati, on the 20th; 28 miles at Columbus, and 40 miles N. W. at Ohio State University on the 3d; 32 miles S. W. at Cleveland, on the 16th; 37 miles W. at Toledo, on the 18th, and 36 miles N. W. on the 4th, and N. on the 18th at Sandusky. Total monthly movement: Cincinnati, 6,226 miles; Columbus, 6,411 miles; Cleveland, 6,506 miles; Toledo, 6,869 miles; O. S. University, 7,916 miles, and Sandusky, 7,436 miles. The prevailing direction of the wind was southwest The percentage of verifications of weather forecasts received from Washington, and distributed to 33 stations, computed from reports of observers, was 92 for weather and 91 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF MARCH, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Departure mean from normal.	No. yr's record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.07	30.57	1st.	29.56	21st.	38	—5	20	66	18th	13	14th.	45	31
Dayton	3.03	3.58	30.07	30.62	1st.	29.51	21st.	37	0	9	64	18th	1	5th.	44	27
Wapakoneta	.....	.....	30.08	30.63	1st.	29.57	21st	33	—2	7	62	18th	—5	5th.	39	24
Greenville	.....	.....	30.12	30.61	1st.	29.50	21st	34	—2	6	60	18th.	—1	5th.	40	26
Celina	.....	.....	30.08	30.60	1st.	29.56	21st.	36	—4	4	66	18th.	7	1st.	46	28
Up'r Sandusky	6.13	6.39	30.07	30.60	1st.	29.60	21st.	34	—1	9	59	18th	2	1st.	40	24
Findlay	.....	.....	30.08	30.66	1st.	29.52	31st.	32	—1	3	61	18th.	—1	1st.	40	25
Tiffin	.....	.....	30.08	30.61	1st.	29.58	31st	33	+1	2	60	18th.	1	1st.	41	26
Wauseon	4.32	4.97	30.09	30.65	1st.	29.55	31st.	31	—1	22	62	18th.	—4	1st	40	22
Montpelier	.....	.....	.....	.....	.....	.....	.....	30	.....	...	55	*3	—4	1st.	37	22
Clarksville	6.32	6.74	30.08	30.6	1st.	29.52	21st.	36	—1	7	64	18th.	7	15th.	43	29
N. Lewisburg	1.71	1.78	30.10	30.65	1st	29.62	21st	34	—2	9	62	18th.	—1	1st.	42	21
Bangorville	.....	.....	30.12	30.64	1st.	29.61	13th.	32	—1	5	60	18th.	2	15th.	40	22
Toledo	.....	.....	30.09	30.62	1st	29.56	31st.	32	—3	.....	56	18th.	8	1st	38	26
Sandusky	1.77	2.90	30.08	30.59	1st.	29.55	31st.	32	—2	12	60	18th	8	15th	39	26
Hanging Rock	6.87	3.16	30.03	30.59	1st.	29.52	13th.	39	—1	9	70	18th.	12	15th	50	30
Portsmouth	.....	.....	30.06	30.57	1st.	29.59	13th	41	0	7	71	18th.	6	*8	52	32
Waverly	.....	....	30.05	30.62	1st.	29.57	31st.	38	+1	8	72	18th	10	1st	49	28
Georgetown	.....	.....	30.06	30.57	1st.	29.52	21st.	39	—1	6	69	18th	12	14th.	48	30
Columbus	.....	.....	30.08	30.61	1st.	29.55	21st.	35	—4	12	63	18th	6	1st.	41	28
O. S. University	.....	.....	30.06	30.63	1st.	29.55	21st	35	0	9	63	18th	—2	5th	43	27
Westerville	2.55	3.77	30.00	30.50	15th	29.53	21st.	35	—1	16	62	18th.	—2	1st.	43	27
Logan	.....	.....	30.06	30.64	1st.	29.55	13th.	37	0	8	68	18th	1	1st.	47	28
Oberlin	.....	.....	30.10	30.63	1st.	29.58	31st.	32	0	9	59	18th	6	1st.	41	24
Marietta	.....	.....	30.09	30.64	1st.	29.45	13th	40	+2	9	67	18th	10	1st.	51	32
McConnelsville	.....	.....	30.08	30.69	1st.	29.45	13th.	37	0	7	67	18th.	5	5th.	47	28
Pomeroy	.....	.....	30.06	30.49	1st,	29.57	21st.	41	—7	6	67	18th.	11	*14	50	31
Athens	.....	.....	30.09	30.59	1st.	29.56	13th.	39	0	3	66	18th.	8	1st.	49	26
Granville	.....	.....	30.08	30.59	1st.	29.56	13th	33	—2	6	62	18th.	4	1st	42	23
Newcom'rstown	.....	.....	30.07	30.63	1st.	29.45	13th.	35	—1	5	64	18th.	0	1st	43	25
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	35	—1	6	61	18th.	2	1st.	42	27
Canton	.....	.....	30.07	30.65	1st.	29.45	13th.	34	+2	9	62	18th	2	1st.	42	26
Youngstown	0.80	0.61	30.06	30.57	1st.	29.49	13th.	35	0	6	63	18th.	5	1st.	42	26
Hiram	.....	.....	30.08	30.62	1st.	29.46	13th.	31	+1	7	59	18th	2	1st.	39	22
Wooster	4.39	4.16	30.10	30.69	1st.	29.55	13th.	32	+4	8	61	18th.	0	1st.	41	25
Cleveland (S. O.)	.....	.....	30.10	30.62	1st.	29.54	13th.	32	—1	21	60	18th.	11	15th	39	26
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	33	+1	8	50	18th.	11	15th	42	26
Akron	0.03	.....	30.07	30.62	1st.	29.47	13th.	33	—1	4	59	18th.	7	1st.	42	25
State—Mean	.....	.....	30.08	30.61	.....	29.53	.....	35	0	9	63	.....	4	.....	43	26
Highest	.....	.....	30.12	30.69	1st.	29.61	.....	41	+4	.....	74	18th	16	*8	52	32
Low st	.....	.....	30.03	30.49	.....	29.45	13th.	30	—7	.....	55	.....	—5	5th.	37	22
Range	.....	.....	.09	.20	.....	.16	.....	11	11	....	19	.....	21	.....	15	10

*1—13th, 15th and 29th. *2—21st and 27th. *3—13th and 29th. *4— 6th and 27th.
*9—7th, 22d, 30th and 31st. *10—9th and 13th. *11—7th, 20th 22d and 27th. *12—3d and 7th.

The mean atmospheric pressure, 30.08 inches, was .02 inch above the average. The highest barometer 30.69 inches, occurred at Wooster on the 1st, and the lowest, 29.45 inches, on the 13th at Marietta, McConnelsville, Newcomerstown and Canton. The mean temperature of the northern section was 32°; of the middle section, 44°; of the southern section 38°, and of the State, 35°. The means for the northern section and the State were normal, and the middle and southern 1° below respectively. The following days of the month were below the normal: 1st to 6th, 9th, 13th, 15th 17th, 19th, 25th to 27th. The maximum temperature, 74°, occurred at Portsmouth on the 18th and the minimum temperature, 5° below zero, at Wapakoneta on the 5th. This is the lowest minimum temperature reported for March since 1888. The mean of maximum temperatures for the month was 43°, and of minimum, 26°. The mean daily range of temperature was 17°. The greatest daily range was 45°, on the 18th, at Waverly, and the least, 2°, on the 13th at Tiffin and Oberlin and on the 22d at Hiram. The mean relative humidity, 82 per cent., was 3 per cent. above the average. The mean precipitation for the northern section was 3.34 inches; for the middle section, 4.22 inches; for the southern section, 5.01 inches, and for the State, 4.19 inches. These means are 0.81 inch, 1.18 inches, 1.75 inches, and 1.26 inches above the averages for the sections and State respectively. Precipitation was general in all sections on the 2d, 3d, 6th, 8th, 9th, 12th, 13th, 19th 20th, 22d, 27th, 28th, 30th, and 31st; in the northern on the 4th; northern and middle, 22d, and middle and southern, 7th and 25th. Local precipitation occurred in all sections on the 1st, 11th, 14th; northern section on the 5th, 7th, 15th, 18th, and 26th; northern and middle on the 20th, and southern on the 22d and 25th. It fell in the

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Fahrenheit. Daily range. Mean.	Greatest.	Date.	Least.	Date.	Relative humidity.	Precipitation—In inches. Total for m'th, including melted snow.	Departure from normal.	Normal.	No y'rs record.	Average daily.	Greatest in 24 consec. hrs	Snowfall Total for month.	On g'nd at end of month.	No. days when 1 inch or more fell	Number of days. Clear	Fair	Cloudy	Greatest direction of wind
14	28	17th	4	20th	73	4.86	+1.37	3.49	20	.16	1.21	5.6	.....	17	[illegible]	9	17	N. E.
16	32	28th.	5	20th	80	4.90	+1.91	2.99	9	.13	1.00	8.8	.....	12	7	[illegible]	19	N. E.
16	35	5th.	4	19th	91	3.36	—0.50	3.86	6	.11	1.60	20.6	.....	[illegible]	[illegible]	5	[illegible]	N. E.
14	28	5th.	4	27th.	90	5.61	+2.12	3.49	6	.18	1.02	11.3	.....	15	[illegible]	9	19	N. E.
17	30	[1]	7	[2]	83	4.52	+1.28	3.24	4	.15	1.30	6.5	.....	11	[illegible]	6	19	N. W.
16	30	15th	6	19th.	92	3.00	+0.53	2.52	9	.10	.92	10.0	.....	13	[illegible]	9	17	N. E.
15	30	18th.	4	19th.	87	4.05	+0.82	3.23	3	.13	1.04	18.2	.....	11	7	[illegible]	19	N. E.
14	28	18th	2	19th	81	3.19	—0.55	3.19	2	.10	.67	11.4	.....	15	6	9	16	W
18	40	5th	5	27th.	78	4.44	+1.38	3.06	19	.14	2.19	17.4	.....	19	[illegible]	12	17	N. E.
15	33	15th	3	[3]	....	3.63	.....	.....	.....	.12	.95	2.2	.....	11	5	3	[illegible]	N. E.
14	30	1 th.	5	[5]	79	5.41	+1.45	3.76	6	.17	1.41	4.7	.....	18	6	6	[illegible]	E.
18	32	[6]	7	[7]	79	5.35	+2.24	3.11	9	.17	1.1	11.0	.....	11	5	9	17	N. E.
18	32	17th	6	19th.	78	4.15	+0.66	3.49	5	.13	.78	8.5	.....	11	9	4	21	N. E.
12	27	15th	3	9th.	79	2.27	—0.13	2.14	.....	.07	.54	10.0	.....	16	9	[illegible]	[illegible]	N. E.
13	28	18th.	5	26th.	79	2.27	—0.33	2.60	12	.07	.6	6.1	.....	15	1	4	26	E.
20	40	18th.	4	7th.	88	5.75	+2.04	3.71	9	.18	.68	2.0	.....	4	7	7	17	E.
19	41	18th	7	3d.	82	5.70	+1.57	4.13	7	.18	.70	2.0	.....	16	8	7	16	E.
20	45	18th	6	7th.	79	5.52	+1.03	3.49	8	.18	.72	3.6	.....	17	5	8	17	N. E.
18	37	17th.	7	[9]	86	6.25	+2.25	4.00	8	.20	1.04	3.6	.....	18	4	6	21	N. E.
13	29	17th	3	[10]	75	4.61	+1.40	3.21	12	15	.82	9.8	.....	17	7	6	18	E.
16	33	18th	7	[11]	80	4.39	+1.24	3.15	9	.14	.91	8.5	.....	16	6	11	14	N. E.
16	29	15th	6	27th	83	4.56	1.26	3.30	16	.15	1.25	7.5	.....	15	6	9	16	N.
18	40	18th	3	22d.	87	5.00	+1.82	3.17	1	.16	97	7.0	.....	13	7	7	7	N. E.
16	34	17th	2	19th.	81	.70	0.41	2.26	9	.09	75	2.8	.....	11	2	11	18	W
19	34	18th	7	[12]	79	4.73	+1.14	3.59	9	.15	98	6.2	.....	15	7	5	19	N.
19	40	18th	6	[13]	86	3.56	+1.06	2.50	7	.12	73	6.0	.....	15	7	6	18	N.
19	38	18th	5	7th.	91	2.69	—0.08	2.78	7	.09	1.00	3.0	.....	9	7	5	19	W
22	38	16th	4	23d.	80	4.03	0.12	3.91	3	.13	94	1.5	.....	11	[illegible]	7	18	N. W.
19	39	29th	6	[15]	84	3.59	+1.34	2.25	6	.12	1.47	6.0	.....	9	1[illegible]	16	5	N. E.
18	36	18th.	4	22d	83	2.60	—0.16	2.76	5	.08	78	1.5	.....	9	5	10	16	E.
15	28	[16]	5	7th.	78	3.77	+0.49	3.28	6	.18	1.37	1.8	.....	8	6	7	18	E.
16	31	18th	3	22d.	.....	2.96	+0.49	2.47	9	.10	.61	4.0	.....	14	5	10	16	N.
17	30	11th.	5	22d.	85	3.81	+0.81	3.03	6	.12	1.10	6.9	.....	4	5	10	16	N.
17	31	11th.	2	22d.	90	3.27	+0.55	2.72	7	.11	.71	10.6	.....	17	6	8	17	N.
16	29	29th	6	19th	83	3.31	0.90	2.81	8	12	.79	8.0	.....	14	7	7	17	E.
12	28	17th.	3	19th.	77	2.93	+0.03	2.90	21	.10	.75	9.4	.....	13	6	7	18	N. E.
14	28	17th	5	[16]	.....	3.27	+0.61	2.66	8	.11	.70	13.5	.....	15	4	7	20	N. E.
16	28	17th	6	22d.	81	3.47	+0.38	3.09	4	.11	.65	7.4	.....	21	4	9	18	S.
17	33	.....	5	.....	82	4.19	+1.26	2.93	9	.11	.....	8.4	.....	14	7	6	8	N. E.
22	45	18th.	7	.....	...	6.25	+2.25	4.00	....	.20	2.19	20.6	.....	19	22	16	26	.....
12	27	.....	2	[17]	....	2.27	—0.55	2.14	...	.07	.26	1.8	.....	6	1	...	5	.....
10	18	.....	5	.....	....	3.98	2.80	2.25	.....	.13	1.93	18.8	.....	13	21	16	21	.....

[1]—20th and 27th. [6]—17th and 18th. [7]—16th, 20th and 31st. [9]—1st and 17th.
[10]—20th, 22d and 26th. [13]—1st and 14th. [15]—20th and 22d. [16]—19th and 28th [17]—19th and 22d.

form of snow on the 1st, 2d, 3d, 4th, 6th, 9th, 12th, 13th 14th 15th, 19th, 20th, 26th 27th and 28th; the heaviest occurred on the 2d, 4th and 14th. The average total monthly snowfall for the state was 8.4 inches, ranging from 2 inches at Hanging Rock and New Alexandria, to 20 inches at Montpelier. No snow remained on the ground at the end of the month. Thunder-storms were reported at Georgetown and Newcomerstown on the 18th, and at New Alexandria, Canton Akron, Lordstown, Garrettsville and Salineville on the 31st. During the month the precipitation was not excessive on any single day, but was well distributed throughout the month. The greatest precipitation in 24 consecutive hours was 2.19 inches at Wauseon on the 30th and 31st. The greatest monthly precipitation was 6.25 inches at Georgetown, and the least, 2.27 inches, at Toledo and Sandusky. The highest wind velocities reported during the month were 34 miles W. at Columbus, and 26 miles W. at Ohio State University on the 4th; 26 miles S. at Cincinnati, and 36 miles N. at Sandusky on the 13th; 26 miles N. E. on the 26th at Toledo, and 34 miles S. E. at Cleveland on the 27th. Total monthly movement: Cincinnati, 6,651 miles; Columbus, 7,183 miles; Cleveland, 6,939 miles; Toledo, 8,618 miles; O. S. University, 6,892 miles, and Sandusky, 7,683 miles. The prevailing direction of the wind was northeast. The percentage of verifications of weather forecasts received from Washington, and distributed to 83 stations, computed from reports of observers was 92 for weather and 95 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF APRIL, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches.					Temperature—Degrees									
	7 A. M. to 2 P. M.	9. P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Dep'ture mean from normal.	No. y'rs record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.05	30.27	8th.	29.68	2d.	56	+2	20	85	21st.	26	5th.	66	46
Dayton	2.50	3.13	30.04	30.30	8th.	29.64	2d.	55	+3	9	82	*1	25	5th.	64	43
Greenville	.....	.....	30.08	30.32	8th.	29.69	2d.	52	+1	5	79	17th.	23	5th.	61	42
Celina	.....	.....	30.03	30.30	8th.	29.63	2d.	54	+2	4	85	*1	25	5th.	65	44
Up'r Sandusky	6.90	7.07	30.02	30.32	8th.	29.61	2d.	52	+2	9	80	30th.	24	*2	60	41
Findlay	.....	.....	30.02	30.35	8th.	29.63	2d.	51	+1	4	82	17th.	23	7th.	62	40
Tiffin	.....	.....	30.04	30.36	8th.	29.61	2d.	51	+2	2	80	*3	25	*4	61	41
Wauseon	3.33	3.93	30.03	30.36	8th.	29.67	2d.	50	+3	22	81	21st.	20	5th.	62	39
Montpelier	.....	.....	.....	.....	.....	.....	.....	50	.....	.....	80	21st.	21	5th.	59	39
Clarksville	6.19	6.46	30.06	30.30	8th.	29.67	2d.	54	+2	8	85	21st.	26	*2	64	44
N. Lewisburg	2.00	1.93	30.08	30.39	8th.	29.71	2d.	53	+1	9	85	17th.	24	7th.	64	42
Bangorville	.....	.....	30.08	30.42	9th.	29.66	2d.	50	+2	5	80	*1	21	5th.	61	39
Toledo	.....	.....	30.04	30.31	9th.	29.69	2d.	50	+3	....	79	30th.	23	5th.	58	42
Sandusky	2.43	3.23	30.02	30.34	9th.	29.65	2d.	49	+3	.....	86	30th.	26	4th.	58	41
Hanging Rock	1.53	2.47	30.02	30.24	8th.	29.60	2d.	53	+1	9	91	21st.	24	8th.	69	41
Portsmouth	.....	.....	30.05	30.30	8th.	29.63	.....	56	+2	7	95	17th.	29	8th.	74	45
Waverly	.....	.....	30.02	30.31	8th.	29.61	2d	55	+2	5	93	17th.	24	8th.	71	41
Georgetown	.....	.....	30.05	30.30	8th.	29.63	2d.	56	+2	6	87	19th.	24	4th	69	45
Columbus	.....	.....	30.04	30.30	8th.	29.66	2d.	53	+2	12	83	21st.	28	5th.	62	44
O. S. University	.....	.....	30.03	30.39	9th.	29.60	2d.	52	+2	9	83	17th.	24	7th.	63	41
Westerville	3.60	3.33	30.01	30.30	8th.	29.58	2d.	51	+1	16	81	*1	26	*11	62	41
Logan	.....	.....	30.04	30.31	8th.	29.59	2d.	53	+2	7	90	21st.	23	8th.	67	39
Oberlin	.....	.....	30.05	30.41	8th.	29.63	2d.	48	+2	9	82	*3	20	*2	60	38
Marietta	.....	.....	30.04	30.35	9th.	29.59	2d.	55	+2	9	89	21st.	29	7th.	68	44
McConnelsville	.....	.....	30.04	30.36	8th.	29.52	2d.	54	+3	8	86	21st.	23	8th.	65	40
Pomeroy	.....	.....	30.03	30.27	8th.	29.65	2d.	58	+1	7	89	27th.	24	8th.	68	42
Athens	.....	.....	30.09	30.34	9th.	29.59	2d.	53	0	4	86	*1	23	8th.	63	41
Granville	.....	.....	30.04	30.24	9th.	29.75	2d.	53	+3	5	82	17th.	22	*2	63	42
Newcom'rstown	.....	.....	30.03	30.36	9th.	29.58	2d.	50	0	6	84	21st.	19	7th.	64	38
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	53	+2	7	81	21st.	21	5th.	61	41
Canton	.....	.....	30.02	30.38	9th.	29.58	2d.	50	+2	9	82	21st.	22	5th.	61	40
Youngstown	0.90	1.10	30.02	30.29	9th	29.60	2d.	51	+1	6	82	22d.	18	5th.	62	37
Hiram	.....	.....	30.03	30.40	9th.	29.62	2d.	48	+2	7	80	20th.	15	*14	58	38
Wooster	2.20	1.67	30.04	30.40	9th.	29.63	2d.	49	+2	7	83	21st.	21	7th.	60	39
Cleveland (S. O.)	.....	.....	30.03	30.39	9th.	29.62	2d.	48	+3	21	82	30th.	23	5th.	56	41
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	49	+2	9	82	30th.	22	5th.	57	40
Akron	0.00	0.20	30.02	30.26	9th.	29.60	2d.	50	+2	4	79	*3	21	5th.	59	41
State—Mean	.....	.....	30.04	30.33	.....	29.63	.....	52	+2	9	84	.....	23	.....	63	41
Highest	.....	.....	30.08	30.42	9th.	29.75	2d.	53	+1	.....	95	17th.	29	.....	74	46
Lowest	.....	.....	30.01	30.24	8th.	29.58	2d.	48	+3	.....	79	.....	15	*14	56	37
Range	.....	.....	0.07	0.18	.....	0.17	.....	10	2	.....	16	.....	14	.....	18	19

*1—17th and 21st. *2—4th and 5th. *3—21st and 30th. *4—4th, 5th and 7th. *5—17th and 26th. *10—2d and 4th. *11—7th and 8th. *12—13th and 26th. *13—21st and 25th. *14—5th and 6th. *19—13th and 29th. *20—27th and 30th. *21—2d and 11th.

The mean atmospheric pressure, 30.04 inches, was normal. The highest barometer, 30.42 inches, occurred at Bangorville on the 9th, and the lowest, 29.58 inches, on the 2d, at Westerville, Newcomerstown and Canton. The mean temperature of the northern section was 50°; of the middle section, 52°, of the southern section, 55°, and of the State, 52°. These means are 3°, 2°, 2° and 2° above the averages for the sections and State respectively. The following days of the month were below the normal: 3d to 9th, 11th, 12th, 24th and 25th. The highest daily mean temperatures occurred on the 17th, 18th, 21st and 22d, and the lowest on the 4th. The maximum temperature, 95°, occurred on the 17th at Portsmouth, and is the highest on record for April since the opening of the Bureau. The minimum, 15°, occurred on the 5th and 6th at Hiram. The mean of maximum temperatures was 63°, and of minimum, 41°. The mean daily range of temperature was 22°. The greatest daily range, 50°, occurred on the 27th, at Pomeroy, and on the 30th at Waverly, and the least, 3°, on the 2d at Montpelier, and the 11th at Columbus. The mean relative humidity, 76 per cent. was 3 per cent. above the average. The mean precipitation for the northern section was 1.87 inches; for the middle section, 2.39 inches; for the southern section, 2.12 inches, and for the State, 2.13 inches. These means are 0.46 inch, 0.29 inch, 0.96 inch, and 0.57 inch below the averages for the sections and State respect-

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Fahrenheit.					Relative humidity.	Precipitation—In inches.									Number of days.			Prevailing direction of wind.
Daily range.												Snowfall.						
Mean.	Greatest.	Date.	Least.	Date.		Total for m'th, including melted snow.	Departure from normal.	Normal.	No. y'rs record.	Average daily.	Greatest in 24 consec. hours.	Total for month.	On gr'nd at end of month.	No. days which .01 inch or more fell.	Clear.	Fair.	Cloudy.	
19	31	30th.	5	4th.	63	1.55	—1.53	3.08	20	.05	0.44	T	.....	12	17	6	7	S. E.
21	34	30th	10	4th.	71	2.89	+0.14	2.75	9	.10	0.68	1.1	.....	12	12	12	6	S. W.
19	36	17th	5	4th.	87	3.88	+1.17	2.71	4	.13	0.93	2.0	.....	12	11	12	7	W.
22	39	29th.	10	11th.	81	1.67	—1.15	2.82	4	.06	0.70	2.2	.....	5	8	12	20	N. W.
19	36	26th.	9	4th.	84	2.07	—0.60	2.67	9	.07	0.48	1 8	.....	11	9	18	3	S. W.
22	40	17th	7	4th.	75	2.73	—0.10	2.83	4	.09	0.66	3.8	.....	9	12	12	6	S. W.
19	39	17th.	6	4th.	74	2.20	—1.30	3.50	2	.07	0.56	1.7	.....	14	13	13	4	S. W.
23	40	*5	10	*6	71	4.39	+1.68	2.71	.....	.15	1.06	3.3	.....	13	7	13	10	N. W.
20	39	*18	3	2d.	77	2.71	.....	.....	.....	.09	0.84	2.0	.....	8	6	9	15	S. W.
20	35	29th	6	4th.	75	2.17	—1 22	3.49	8	.07	0.58	2 0	.....	11	11	13	6	N. W.
23	37	26th	5	3d.	76	3 75	+1 07	2.68	9	.12	0.80	2.5	.....	10	9	6	15	W.
22	38	26th	10	2d.	76	2.53	+0.30	2.23	4	.08	0.65	0 8	.....	11	11	13	6	S. W.
16	30	10th	7	16th.	79	1 89	—0.31	2.20	.....	.06	.74	3.6	.....	13	12	8	10	S. W.
17	33	*7	5	11th.	70	2.14	—0 26	2.40	.....	.07	0.65	0.6	.....	14	7	12	11	S. W.
29	47	*8	4	4th.	83	2.03	+1.53	3.56	9	.06	0.71	1.0	.....	9	9	13	8	S. W.
29	48	*19	4	4th.	77	2.36	—0 99	3.35	7	.08	0.66	1.2	.....	12	13	7	10	.....
29	50	30th.	5	4th.	74	1.15	—2.27	3.42	6	.04	0.22	2.2	.....	10	13	8	9	S. W.
24	40	26th.	8	4th.	79	1.70	—1.63	3.33	6	.06	0.38	1.0	.....	11	9	5	16	S. W.
19	33	17th.	3	11th.	68	2.26	—0.75	3.01	12	.10	.66	2.3	.....	12	12	5	13	S.
22	36	*9	8	*10	75	2 02	—0.99	3.01	9	.07	0 40	0.5	.....	11	13	9	8	N. W.
21	26	*12	5	2d	79	2.82	+0 53	2.29	16	.09	0.63	1.2	.....	10	11	13	6	S.
28	47	30th.	8	4th.	75	1.82	—0.87	2.69	7	.06	0 68	1 5	.....	8	11	11	8	W.
22	41	*13	9	4th.	78	1.46	—0.60	2.06	8	.05	0.61	0.2	.....	8	14	9	7	W.
24	41	13th.	8	*14	74	2.08	—1.17	2.08	9	.07	0.70	0.0	.....	10	9	11	10	W.
25	43	*15	9	4th.	83	1.94	—0 93	2 87	8	.06	0.40	T	.....	13	9	8	12	N. W.
26	50	27th	10	*16	82	1.16	—1 50	2.66	7	.04	0.60	1.7	.....	6	16	6	8	W.
25	46	*8	7	4th.	72	1.21	—1.15	2 36	4	.04	0.28	1.2	.....	5	12	9	9	N. W.
21	32	26th.	6	11th.	82	2.14	0.00	2.14	5	.07	0.40	3.5	.....	12	17	8	5	S.
26	46	30th.	9	3d.	79	1.46	—1 24	2.70	6	.05	0.40	T	.....	6	9	13	8	W.
20	36	17th.	8	24th.	73	2.07	—0.81	2 88	7	.07	0.85	0.4	.....	7	15	7	8	S. W.
21	38	17th.	4	4th.	.....	1.65	—0.96	2.61	9	.05	.49	1.0	.....	10	14	13	3	N. W.
25	41	17th	8	4th.	82	1.25	—1 29	2.54	3	.04	0.42	0.5	.....	6	12	11	7	N.
20	40	17th.	9	4th.	75	1 50	—1 06	2.56	7	.05	0 49	1.0	.....	9	12	9	9	N. W.
21	40	17th.	7	6th.	76	1.66	—0 29	1 95	8	.05	0.30	1.5	.....	9	12	10	8	N. W.
16	32	13th.	4	*17	70	1.52	—0 83	2.35	21	.05	0.28	1.5	.....	10	13	7	10	N. W.
17	31	29th.	5	4th.	.....	1.66	—0 63	1 66	9	.06	0.34	.....	.....	10	9	11	10	S
19	37	17th.	5	4th.	77	2 18	+0.09	2.09	4	.08	0.70	1.0	.....	14	10	11	9	N. W.
22	39	.....	6	.....	76	2.13	—0.57	2.70	9	.07	.....	1.6	.....	8	12	9	9	S. W.
29	50	*20	10	.....	87	4.86	.....	3.56	.....	.16	1 30	3.8	.....	14	20	18	20	.....
16	30	.....	3	*21	63	0.48	.....	1 66	.....	.02	0.18	.....	.....	5	6	.....	3	.....
13	20	.....	7	.....	24	4.38	.....	1.90	.....	.14	1.12	3.8	.....	9	14	18	17	.....

*6—3d and 9th. *7—10th and 30th. *8—17th and 30th. *9—13th, 17th, 26th and 27th.
*15—13th and 30th. *16—5th and 15th. *17—4th and 16th. *18—26th and 29th.

ively. Precipitation was general in all sections on the 2d, 3d, 4th, 6th, 9th, 10th, 11th, 14th, 18th and 22d, and local on the 5th, 12th, 15th, 17th, 23d, 24th and 30th. It fell in the form of snow on the 2d, 3d, 4th, 5th, 6th and 24th. The average monthly snowfall for the State was 1.6 inches, ranging from a trace at McConnelsville, to 3.8 inches at Findlay. The greater portion of the precipitation for the month fell before the 2 th only light showers being noted from that date until the 30th. The greatest precipitation in 24 consecutive hours was 1.30 inches, at West Milton on the 9th. The greatest monthly precipitation was 4 86 inches, at West Milton, and the least, 0.48 inch, at Weymouth. The highest wind velocities reported during the month were 39 miles S. E. at Cleveland on the 10th; 35 miles S at Cincinnati and 33 miles S. W. at Columbus on the 21st; 37 miles W. at Toledo 49 miles W. at Ohio State University, and 49 miles N. W. at Sandusky on the 30th. Total monthly movement: Cincinnati, 4,897 miles; Columbus, 5,320 miles; Cleveland, 5 311 miles; Toledo, 6,753 miles; O. S. University, 5 888 miles, and Sandusky, 6.141 miles. The prevailing direction of the wind was S. W. The percentage of verifications of weather forecasts received from Washington, and distributed to 33 stations, computed from reports of observers, was 87 for weather and 92 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF MAY, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Departure mean from normal.	No. years record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.10	30.34	7th.	29.86	2d.	60	—4	20	85	21st.	36	6th.	69	59
Dayton	2.07	2.57	30.10	30.37	7th.	29.81	2d.	60	—3	9	84	*1	33	6th.	70	47
Wapakoneta	.....	.....	30.09	30.36	6th.	29.92	2d.	57	—3	5	84	10th	31	5th.	68	42
Greenville	.....	.....	30.17	30.39	7th.	29.91	2d.	57	—3	6	80	21st.	32	*2	69	49
Celina	.....	.....	30.09	30.37	7th.	29.86	2d.	59	—1	4	83	10th.	32	5th.	70	47
Upper Sandusky	6.10	6.09	30.09	30.35	7th.	29.82	2d.	56	—4	9	82	21st.	29	17th.	66	43
Findlay	.....	.....	30.09	30.37	7th.	29.83	2d.	56	—2	3	84	10th	28	17th	68	43
Tiffin	.....	.....	30.09	30.33	7th.	29.85	10th.	56	0	2	82	10th.	33	17th.	67	47
Wauseon	.....	.....	30.11	30.35	5th.	29.86	10th.	56	—3	22	85	31st.	28	5th.	70	42
Montpelier	.....	.....	.....	.....	.....	.....	.....	56	.....	....	83	31st.	28	5th.	69	42
Clarksville	6.00	6.22	30.11	30.38	7th.	29.83	2d.	58	—3	5	84	21st.	31	*5	70	47
No. Lewisburg	3.40	2.45	30 15	30.39	7th.	29.90	2d.	59	—3	8	85	10th.	32	*6	70	45
Bangorville	.....	.....	30.12	30.37	7th.	29.89	2d.	55	—3	5	81	*7	29	5th.	68	43
Toledo	.....	.....	30.12	30.35	5th	29.86	2d.	56	—3	.....	82	10th.	32	5th.	66	47
Sandusky	2.80	4 06	30.10	30.31	7th.	29.85	2d.	56	—2	13	85	10th.	35	7th.	65	48
Hanging Rock	3.42	3.09	30 07	30.34	7th.	29.82	2d.	57	—4	9	87	10th.	29	6th.	73	45
Portsmouth	.....	.....	30 12	30.37	7th.	29.77	2d.	60	—3	7	93	10th.	36	18th.	76	51
Waverly.	.....	.....	30.09	30.37	7th.	29.82	2d.	60	—3	6	91	10th.	29	*8	76	45
Georgetown	.....	.....	30.07	30.37	7th.	29.76	2d.	61	—3	6	89	10th	32	6th	73	50
Columbus	.....	.....	30.10	30.34	7th.	29.82	2d.	58	—4	12	84	10th.	34	17th	68	47
O. S. University	.....	.....	30 09	30.35	7th.	29.82	2d.	57	—4	9	83	10th	28	7th.	68	44
Westerville	4.52	3.70	30.07	30.34	7th.	29.80	2d.	56	—4	16	82	10th	31	*9	68	45
Logan	.....	.....	30 08	30.37	7th.	29.86	2d.	58	—3	8	89	10th.	29	17th	72	50
Oberlin	.....	.....	30.12	30.36	7th.	29.84	2d.	54	—4	9	84	10th.	26	17th.	66	42
Marietta	.....	.....	30.0	30.34	7th.	29.83	2d.	60	—3	9	82	*10	33	17th.	72	49
McConnelsville	.....	.....	30.08	30 28	7th.	29.80	2d.	60	—2	7	83	*10	29	17th	70	45
Pomeroy	.....	.....	30.06	30.31	7th.	29 82	2d.	64	—3	6	87	23d.	30	17th.	74	46
Athens	.....	.....	30.11	30.35	7th.	29.82	2d.	58	—2	4	85	10th.	28	17th.	71	44
Granville	.....	.....	30.10	30.35	7th.	29.86	2d.	57	—3	7	82	10th.	32	4th.	67	42
Newcomerstown	.....	.....	30.09	30 34	7th.	29.81	2d	56	—4	6	85	10th.	25	17th	70	43
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	58	—3	7	89	10th.	29	17th.	68	46
Canton	.....	.....	30.08	30.34	7th.	.....	.....	56	—3	9	84	10th	28	*8	69	43
Youngstown	0.77	0.77	30.08	30.30	7th.	29.83	2d.	57	—2	6	86	10th.	28	17th.	69	43
Hiram	.....	.....	30.09	30.32	7th.	29.83	2d.	54	—4	7	80	10th	26	5th.	65	43
Wooster	5.77	5.19	30 10	30.37	7th.	29 82	2d.	55	—2	7	82	10th	28	17th.	67	42
Cleveland (S. O.)	.....	.....	30.10	30.34	7th.	29 84	2d.	54	—3	21	82	9th.	32	7th.	62	45
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	55	—2	9	82	9th.	32	7th.	65	45
Akron	0.37	0.49	30.11	30.32	7th.	29.83	10th	56	—1	4	82	10th.	30	*13	67	44
State—mean	.....	.....	30.10	30.35	.....	29.83	.....	58	—2	9	84	.....	30	.....	68	45
Highest	.....	.....	30.15	30 39	7th.	29.92	.....	64	.....	....	93	10th	36	.....	76	51
Lowest	.....	.....	30.06	30.28	.....	29.76	2d.	54	.....	....	80	.....	25	17th.	62	42
Range	.....	.....	0.09	0.11	.....	0.16	.....	10	.....	..	13	.....	11	.....	14	9

*1—21st and 22d. *2—6th and 7th. *3—23d and 29th *4—13th and 19th. *5—6th and 17th.
*11—24th and 25th. *12—6th and 29th. *13—5th, 7th and 17th *14—9th and 17th.

The mean atmospheric pressure, 30.10 inches, was 13 inch above the normal. The highest barometer, 30.39 inches, occurred at Cincinnati, Greenville and North Lewisburg on the 7th, and the lowest, 29.76 inches, at Georgetown on the 2d. The mean temperature of the northern section was 56°; of the middle section, 57°; of the southern section, 60°, and of the State, 58°. These means are 2°, 3°, 2° and 2° below the averages for the sections and State respectively. The following periods were below the normal: 3d to 8th, 11th to 19th, and 23d to 31st. The greatest departures occurring on the 5th, 6th, 17th and 28th. Killing frosts with ice forming, were reported generally from all sections on the mornings of the 5th, 6th, 7th and 17th, tender plants and fruit being seriously damaged in nearly all portions of the State. The wheat plant was badly injured in the north-east portion of the State, late reports indicating that only one-half of an average crop would be harvested. The maximum temperature of the month, 93°, occurred on the 10th at Portsmouth, and the minimum, 25°, at Newcomerstown on the 17th. The mean of maximum temperatures was 68°, and of minimum, 45°. The mean daily range of temperature was 24°. The greatest daily range, 48°, occurred on the 14th, at Logan, and the least, 4 , on the 16th at Cleveland (S O), and 23d at Westerville. The mean relative humidity, 73 per cent., was 1 per cent, below the average The mean precipitation for the northern section was 2.69 inches; for the middle section, 2 5 inches; for the southern section, 1.97 inches, and for the State, 2.20 inches These means are 1.88 inches, 1 71 inches, 1 82 inches, and 1.84 inches below the averages for the sections and State respectively. Precipitation was general in all

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Fahrenheit.						Precipitation—in inches.									Number of days.			
Daily range.												Snowfall.						
Mean.	Greatest.	Date.	Least.	Date.	Relative humidity.	Total for month, including melted snow.	Departure from normal.	Normal.	No. yrs record.	Average daily.	Greatest in 24 consec. hrs.	Total for month.	On ground at end of month.	No. days which .01 inch or more fell.	Clear.	Fair.	Cloudy.	Prevailing direction of wind.
19	32	18th.	7	26th.	6[illegible]	1.08	—2.41	3.49	20	.04	0.51	.....	.....	8	13	7	11	N.
22	37	18th	7	28th.	68	0.99	—2.92	3.91	9	.03	0.51	.....	.....	5	12	10	9	N. E.
26	40	*14	14	23d.	83	0.95	—3.46	4.41	6	.03	0.75	.....	.....	4	18	6	7	S. W.
20	32	15th	9	29th.	85	0.92	—3.01	3.93	6	.03	0.43	.....	.....	5	9	10	12	N.
23	36	15th	8	29th.	79	1.46	—2.30	3.76	4	.05	0.72	.....	.....	5	10	15	6	N. E.
24	36	*15	8	4th	83	1.32	—3.11	4.43	9	.04	0.50	.....	.....	9	10	15	6	N. E.
26	42	15th.	8	29th.	70	1.84	—2.31	4.15	3	.06	0.65	.....	.....	8	13	11	7	N. E.
20	31	19th.	8	*3	69	1.57	—2.50	4.07	2	.05	0.45	.....	.....	11	16	9	6	N.
28	45	19th.	8	29th.	66	1.49	—2.55	4.04	20	.05	0.46	.....	.....	11	12	12	7	N. E.
27	42	*4	8	29th.	71	1.91	.....	.....	.....	.06	0.65	.....	.....	7	17	6	8	S. W.
23	35	18th.	9	28th.	71	1.53	—1.86	3.39	5	.05	0.71	.....	.....	8	11	12	8	N.
25	38	18th	7	23d.	72	3.40	—0.90	4.30	8	.11	1.60	.....	.....	8	12	12	7	N
25	35	17th.	8	28th.	74	2.17	—2.29	4.46	5	.07	0.92	T	.....	6	9	12	10	N. E.
19	31	15th	7	29th	65	0.79	—2.57	3.36	.....	.02	0.28	.....	.....	8	12	12	7	N. E.
18	36	15th	5	29th	64	1.48	—2.03	3.51	13	.15	0.70	.....	.....	8	10	7	14	E.
28	46	18th	8	28th	84	1.25	—2.46	3.71	9	.04	0.51	.....	.....	8	4	18	9	N. E.
25	47	18th.	7	28th.	80	1.55	—1.75	3.30	9	.05	0.30	.....	.....	10	13	8	10	N. W.
30	47	*16	14	26th.	75	1.71	—1.57	3.28	7	.06	0.91	.....	.....	11	13	8	10	N.
23	37	10th	6	11th.	76	1.47	—1.59	3.06	6	.05	0.77	.....	.....	8	10	5	16	N. W.
21	35	18th.	6	23d.	63	2.73	—1.97	4.70	12	.09	0.48	.....	.....	12	10	13	8	N.
24	42	18th.	6	23d.	72	2.82	—2.18	5.00	9	.19	0.70	.....	.....	11	14	12	5	N.
24	41	18th.	4	23d.	77	2.44	—1.14	3.58	16	.08	0.73	.....	.....	6	8	17	6	N.
22	48	11th.	8	23d.	76	3.05	—0.86	3.91	8	.10	0.75	.....	.....	10	9	8	14	N. E.
24	37	19th.	11	23d.	75	2.55	—1.65	4.20	9	.08	0.90	.....	.....	7	13	6	12	N.
22	40	19th	11	28th.	74	2.29	—1.59	3.88	9	.07	0.86	.....	.....	8	7	9	15	N. W.
25	45	18th.	8	23d.	84	3.76	—0.21	3.55	7	.12	1.89	.....	.....	14	9	6	16	N.
28	42	*17	16	28th	79	2.65	—0.55	3.20	7	.09	0.75	.....	.....	6	17	9	4	W
27	46	18th.	11	23d.	70	2.25	—1.03	3.28	4	.07	0.55	.....	.....	8	5	12	14	N. W.
25	37	22d	12	11th.	67	2.57	—1.14	3.71	7	.08	1.00	.....	.....	7	15	4	.....	N. W
28	47	19th.	8	28th.	78	2.92	—0.92	3.84	6	.09	1.12	.....	.....	5	11	12	8	N.
23	40	18th	11	24th	73	4.46	+0.76	3.70	7	.14	1.50	T	.....	8	10	11	10	N.
26	41	19th.	8	22d.	.....	2.26	—1.69	3.95	9	.07	1.29	.....	.....	11	12	14	5	N.
26	44	10th.	10	21st.	79	3.06	0.00	3.06	6	.10	1.10	.....	.....	6	11	10	10	N.
22	30	*11	11	*12	70	2.33	—1.31	3.64	7	.08	1.81	T	.....	5	15	11	5	N. E.
25	40	19th.	8	28th.	69	2.24	—1.65	3.89	8	.07	1.57	.....	.....	10	10	12	9	N.
17	33	15th.	4	16th.	67	2.59	—0.76	3.35	21	.08	1.54	.....	.....	10	9	13	9	N. W.
19	33	15th	7	6th.	.....	2.91	—1.32	4.23	9	.09	1.68	.....	.....	12	11	12	8	N.
23	34	18th.	9	6th.	82	2.15	—1.32	2.15	5	.07	1.49	.....	.....	11	9	12	10	N
24	39	.....	9	.....	73	2.20	—1.84	4.04	9	.07	.....	T	.....	8	12	10	9	N.
30	48	1[illegible]th.	16	.....	85	4.46	—3.46	5.00	.....	.14	2.24	T	.....	14	23	18	17	.....
17	30	.....	4	16th.	61	0.79	0.00	2.15	..	.02	0.28	T	.....	4	4	....	3	.....
13	18	.....	12	.....	24	3.67	3.46	2.85	....	.12	1.96	T	.....	10	19	18	11	.....

*6—5th and 17th. *7—10th and 31st *8—7th and 17th. *9—19th and 22d. *10—10th and 23d.
*15—14th and 15th *16—9th and 10th [illegible]—30th and 18th

sections on the 2d, 3d, 11th, 19th, 20th, 21st, 22d, 23d, 28th and 29th, and in the northern on the 4th and 26th, and local in all on the 1st and 30th; in the northern on the [illegible]th, and middle and southern on the 26th and 27th. With the exception of a few light showers, the drouth that began during the month of April continued until the 19th; from that time until the end of the month copious showers fell, reviving the vegetation, which had begun to suffer seriously. Hiram, Barnesville, New Alexandria, Weymouth, Garrettsville and Orangeville each report a trace of snowfall during the month. The greatest precipitation in 24 consecutive hours was 2.24 inches at Elyria on the 21st. The greatest monthly precipitation was 4.46 inches at New Alexandria, and the least, 0.79 inch, at Toledo. The highest wind velocities reported during the month were 26 miles N. W. at Cincinnati on the 4th; 8 miles N. W. at Toledo on the 15th; 30 miles S. W. at Cleveland on the 24th; 42 miles W. at Ohio State University, and 28 miles N. W. at Sandusky on the 21st, and 21 miles N. E. at Columbus on the 27th. Total monthly movement: Cincinnati, 4,553 miles, Columbus 4,865 miles; Cleveland, 5,222 miles; Toledo, 5,005 miles; O. S. University, 5,536 miles, and Sandusky, 6,167 miles. The prevailing direction of the wind was N. The percentage of verifications of weather forecasts received from Washington and distributed to 73 stations, computed from reports of observers, was 89 for weather and 89 for temperature.

CHAS. M. STRONG, Sec'y. O. M. Bureau.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JUNE, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches.					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Dep'ture mean from normal.	No y'rs record.	Max. Highest	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	29.99	30.16	5th.	29.59	18th.	74	+1	20	92	26th.	54	*1	83	65
Dayton	2.88	3.55	29.95	30.19	5th.	29.58	18th.	73	0	9	93	29th.	54	*2	83	63
Greenville	.....	.....	29.96	30.21	5th.	29.60	18th.	70	0	6	86	26th.	51	5th.	78	60
Celina	.....	.....	29.92	30.19	5th.	29.56	18th.	71	0	4	90	15th.	50	5th.	81	62
Upp. Sandusky	6.17	6.17	29.94	30.18	5th.	29.56	19th.	70	0	9	91	16th.	48	13th.	80	58
Findlay	.....	.....	29.95	30.22	5th.	29.56	18th.	70	—1	3	91	14th.	45	13th.	81	58
Tiffin	.....	.....	29.95	30.21	5th.	29.56	19th.	70	.....	.....	90	*4	49	*5	80	62
Wauseon	2.70	2.70	29.96	30.25	5th.	29.61	19th.	69	+1	22	94	16th.	40	5th.	82	57
Montpelier	.....	.....	.....	.....	.....	.....	.....	69	.....	.....	93	14th.	42	5th.	80	57
Clarksville	5.17	5.17	29.98	30.18	5th.	29.60	18th.	71	0	5	91	*6	53	5th.	83	62
No. Lewisburg	.....	.....	29.98	30.21	5th.	29.56	18th.	72	+1	9	94	14th.	48	6th.	83	61
Bangorville	.....	.....	29.99	30.21	5th.	29.62	19th	68	0	5	95	*3	43	5th.	82	58
Toledo	.....	.....	29.99	30.27	5th.	29.65	18th	69	+1	.....	89	25th.	48	5th.	78	61
Sandusky	.....	.....	29.97	30.24	5th.	29.64	18th.	70	+1	.....	89	15th.	51	4th.	77	62
Hanging Rock	1.66	1.66	29.94	30.10	5th.	29.61	19th.	71	+2	7	92	*7	55	1st.	85	61
Portsmouth	.....	.....	29.96	30.14	25th.	29.62	18th	73	+2	7	94	*9	55	6th.	87	64
Waverly	.....	.....	29.96	30.17	25th.	29.58	17th.	74	+2	8	98	*6	53	5th.	90	60
Georgetown	.....	.....	29.94	30.17	25th.	29.56	18th	74	+2	6	96	14th.	52	2d.	86	65
Columbus	.....	.....	29.96	30.18	5th.	29.57	18th	72	+2	13	91	15th.	52	5th.	82	63
O. S. University	.....	.....	29.94	30.16	5th.	29.56	18th	71	+1	9	91	26th.	52	*13	82	60
Westerville	3.75	2.50	29.93	30.14	5th.	29.55	19th.	69	+1	16	90	26th.	51	28th.	82	60
Logan	.....	.....	29.95	30.13	13th	29.60	18th.	71	+1	8	94	29th.	52	8th.	85	61
Oberlin	.....	.....	29.98	30.23	5th.	29.63	18th	68	+1	9	92	*4	43	5th.	80	58
Marietta	.....	.....	29.96	30.14	25th	29.59	19th.	73	+2	9	91	26th.	54	28th.	84	63
McConnelsville	.....	.....	29.96	30.11	5th.	29.59	19th.	71	+1	8	89	*16	50	28th.	82	60
Pomeroy	.....	.....	29.93	30.10	5th.	29.61	18th.	75	0	8	93	16th.	49	1st.	86	60
Athens	.....	.....	29.98	30.17	8th.	29.63	19th.	71	+1	4	92	26th	53	5th.	83	60
Granville	.....	.....	29.97	30.16	24th.	29.61	19th.	71	+2	6	92	*17	49	7th.	83	60
Newcom'stown	.....	.....	29.96	30.16	25th	29.58	18th.	69	+1	6	91	*18	46	28th.	83	58
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	70	+1	7	91	14th.	49	8th.	81	60
Canton	.....	.....	29.95	30.18	5th.	29.56	18th.	70	+2	9	91	15th	48	5th.	82	59
Youngstown	0.93	0.83	29.94	30.19	5th.	29.58	18th	70	+1	6	92	15th.	45	5th.	80	58
Hiram	.....	.....	29.96	30.21	5th.	29.62	18th.	67	0	4	87	15th.	43	5th.	79	58
Wooster	4.96	4.20	29.96	30.20	5th.	29.58	19th.	68	—1	7	89	15th.	44	5th.	80	58
Cleveland (S. O.)	.....	.....	29.97	30.25	5th.	29.62	18th.	68	+2	20	87	25th.	47	5th.	76	60
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	68	0	9	87	25th.	46	5th.	77	60
Akron	0.43	0.20	29.95	30.19	5th.	29.58	18th.	69	+1	5	89	15th.	45	5th.	80	59
State—Mean	.....	.....	29.96	30.18	.....	29.59	.....	71	+2	9	91	.....	49	.....	82	60
Highest	.....	.....	29.99	30.27	5th.	29.65	.....	75	0	.....	98	*6	55	.....	90	65
Lowest	.....	.....	29.93	30.10	.....	29.55	19th.	67	0	.....	86	.....	40	5th.	76	57
Range	.....	.....	0.06	0.17	.....	0.10	.....	8	0	.....	12	.....	15	.....	14	8

*1—5th and 6th. *2—5th, 6th and 7th. *3—14th and 25th. *4—15th and 16th. *5—5th and 7th. *11—7th, 20th and 22d. *12—1st, 2d and 25th. *13—5th, 6th and 13th. *14—25th and 28th.

The mean atmospheric pressure, 29.96 inches, was .02 inch below the average. The highest barometer, 30.27 inches, occurred at Toledo on the 5th, and the lowest, 29.55 inches, at Westerville on the 19th. The mean temperature of the northern section was 69°; of the middle section, 70°, of the southern section, 73°, and of the State, 71°. These means are 1°, 1°, 2° and 2° above the averages for the sections and State respectively. The following days were below the normal: 4th to 8th, 20th to 27th. The greatest departure occurring on the 6th. Seventeen days were above the normal, the greatest departure being 9° on the 10th. The maximum temperature of the month, 98°, occurred on the 14th and 26th at Waverly, and the minimum, 40°, on the 5th at Wauseon. The mean of maximum temperatures was 82°, and of minimum, 60°. The mean daily range of temperature was 22°. The greatest daily range, 45°, occurred on the 14th, at Wauseon, and the least, 3°, on the 6th at Toledo. The mean relative humidity, 80 per cent., was 3 per cent above the average. The mean precipitation for the northern section was 4.77 inches; for the middle section, 4.31 inches; for the southern section, 5.37 inches, and for the State, 4.82 inches. These means are 0.95 inch, 0.41 inch 1.18 inches, and 0.85 inch above the averages for the sections and State respectively. Precipation was general

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Fahrenheit. Daily range. Mean.	Greatest.	Date.	Least.	Date.	Relative humidity.	Precipitation—In inches. Total for m'th, including melted snow.	Departure from normal.	Normal.	No y'rs record.	Average daily.	Greatest in 24 consec h'rs.	Snowfall Total for month.	On gr'nd at end of month.	No days which .01 inch or more fell.	Number of days. Clear.	Fair.	Cloudy.	Prevailing direction of wind.
19	32	18th	7	26th.	61	1.08	—2.41	3.49	20	.04	0.54	.....	.....	8	13	7	11	N.
23	37	18th.	7	28th	68	0.99	—2.92	3.91	9	.03	0.51	.....	.....	5	12	10	9	N. E.
26	40	*14	14	23d.	83	0.95	—3.46	4.41	6	.03	0.75	.....	.....	4	18	6	7	S. W.
20	32	15th.	9	29th.	85	0.92	—3.01	3.93	6	.03	0.43	.....	.....	5	9	10	12	N.
23	36	15th.	8	29th.	79	1.46	—2.30	3.76	4	.05	0.72	.....	.....	5	10	15	6	N. E.
24	36	*15	8	4th.	83	1.32	—3.11	4.43	9	.04	0.50	.....	.....	9	10	15	6	N. E.
26	42	15th.	8	29th.	70	1.84	—2.31	4.15	3	.06	0.65	.....	.....	8	13	11	7	N. E.
20	31	19th.	8	*3	69	1.57	—2.50	4.07	2	.05	0.45	.....	.....	11	16	9	6	N.
28	45	19th.	8	29th.	66	1.49	—2.55	4.04	20	.05	0.46	.....	.....	11	12	12	17	N. E.
27	42	*4	8	29th.	71	1.91	.....	.....	.....	.06	0.65	.....	.....	7	17	6	8	S. W.
23	35	18th.	9	28th	71	1.53	—1.86	3.39	5	.05	0.71	.....	.....	8	11	12	8	N.
25	38	18th.	7	23d.	72	3.40	—0.90	4.30	8	.11	1.60	.....	.....	8	12	12	7	N.
25	35	17th.	8	28th	74	2.17	—2.29	4.46	5	.07	0.92	T	.....	6	9	12	10	N. E.
19	1	15th	7	29th.	65	0.79	—2.57	3.36	.....	.02	0.28	.....	.....	8	12	12	7	N. E.
18	36	15th.	5	29th	64	1.48	—2.03	3.51	13	.05	0.70	.....	.....	8	10	7	14	E.
28	46	18th	8	28th	84	1.25	—2.46	3.71	9	.04	0.51	.....	.....	8	4	18	9	N. E
25	47	18th.	7	28th	80	1.55	—1.75	3.30	9	.05	0.30	.....	.....	10	13	8	10	N. W.
30	47	*16	14	26th.	75	1.71	—1.57	3.28	7	.06	0.91	.....	.....	11	13	8	10	N.
23	37	10th	6	11th.	76	1.47	—1.59	3.06	6	.05	0.77	.....	.....	8	10	5	16	N. W.
21	35	18th.	6	23d	63	2.73	—1.97	4.70	12	.09	0.48	.....	.....	12	10	13	8	N.
24	42	18th.	6	23d.	72	2.82	—2.18	5.00	9	.09	0.70	.....	.....	11	14	12	5	N.
24	41	18th.	4	23d.	77	2.44	—1.14	3.58	16	.08	0.73	.....	.....	6	8	17	6	N.
22	48	14th.	8	23d.	76	3.05	—0.86	3.91	8	.10	0.75	.....	.....	10	9	8	14	N. E.
24	37	19th.	11	23d.	75	2.55	—1.65	4.20	9	.08	0.90	.....	.....	7	13	6	12	N.
22	40	19th.	11	28th.	74	2.29	—1.59	3.88	9	.07	0.86	.....	.....	8	7	9	15	N. W.
25	45	18th.	8	23d.	84	3.76	+0.21	3.55	7	.12	0.89	.....	.....	14	9	6	16	N.
28	42	*17	16	28th.	79	2.65	—0.55	3.20	7	.09	0.75	.....	.....	6	17	9	5	W.
27	46	18th.	11	23d.	70	2.25	—1.03	3.28	4	.07	0.55	.....	.....	8	5	12	14	N. W.
25	37	22d.	12	11th.	67	2.57	—1.14	3.71	7	.08	1.00	.....	.....	7	15	14	.....	N. W.
28	47	19th.	8	28th	78	2.92	—0.92	3.84	6	.09	1.12	.....	.....	5	11	12	8	N.
23	40	18th.	11	24th.	73	4.46	+0.76	3.70	7	.14	1.50	T	.....	8	10	11	10	N.
26	41	19th.	8	22d.	.....	2.26	—1.69	3.95	9	.07	1.29	.....	.....	11	12	14	5	N.
26	44	10th.	10	21st.	79	3.06	0.00	3.06	6	.10	1.10	.....	.....	6	11	10	10	N.
22	30	*11	11	*12	70	2.33	—1.31	3.64	7	.08	1.81	T	.....	5	15	11	5	N. E.
25	40	19th.	8	28th.	69	2.24	—1.65	3.89	8	.07	1.57	.....	.....	10	10	12	9	N.
17	33	15th.	4	16th.	67	2.59	—0.76	3.35	21	.08	1.54	.....	.....	10	9	13	9	N. W.
19	33	15th.	7	6th.	.....	2.91	—1.32	4.23	9	.09	1.68	.....	.....	12	11	12	8	N.
23	34	18th.	9	6th.	82	2.15	—1.32	2.15	5	.07	1.49	.....	.....	11	9	12	10	N.
24	39	.....	9	.....	73	2.20	—1.84	4.04	9	.07	.....	T	.....	8	12	10	9	N.
30	48	14th.	16	.....	85	4.46	—3.46	5.00	.....	.14	2.24	T	.....	14	23	18	17	.....
7	30	.....	4	16th.	61	0.79	0.00	2.15	.....	.02	0.28	T	.....	4	4	.....	3	.....
13	18	.....	12	.....	24	3.67	3.46	2.85	.....	.12	1.96	T	.....	10	19	18	14	.....

*5—5th and 17th. *7—10th and 31st. *8—7th and 17th. *9—19th and 22d. *10—10th and 22d. *15—14th and 15th. *16—9th and 10th. *17—10th and 18th.

in all sections on the 2d, 3d, 11th, 19th, 20th, 21st, 22d, 23d, 28th and 29th, and in the northern on the 4th and 26th, and local in all on the 1st and 30th; in the northern on the 5th, and the middle and southern on the 26th and 27th. With the exception of a few light showers, the drouth that began during the month of April continued until the 19th; from that time until the end of the month copious showers fell, reviving the vegetation which had begun to suffer seriously. Hiram, Bangorville, New Alexandria, Weymouth, Garrettsville and Orangeville each report a trace of snowfall during the month. The greatest precipation in 24 consecutive hours was 2.24 inches at Elyria on the 21st. The greatest monthly precipitation was 4.46 inches at New Alexandria, and the least, 0.79 inch, at Toledo. The highest wind velocities reported during the month were 26 miles N. W. at Cincinnati, on the 4th; 28 miles N. W. at Toledo, on the 15th; 30 miles S. W. at Cleveland, on the 20th; 42 miles W. at Ohio State University, and 28 miles N. W. at Sandusky, on the 21st, and 24 miles N. E. at Columbus, on the 27th. Total monthly movement: Cincinnati, 4,583 miles; Columbus, 4,855 miles; Cleveland, 5,222 miles; Toledo, 5,605 miles; O. S. University, 5,536 miles, and Sandusky, 6,167 miles. The prevailing direction of the wind was N. The percentage of verifications of weather forecasts received from Washington, and distributed to 33 stations, computed from reports of observers, was 89 for weather and 89 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JULY, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches.					Temperature—Degrees									
	7 A. M to 2 P. M	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Dep'ture mean from normal.	No. y'rs record	Max Highest.	Max Date.	Min. Low st.	Min. Date.	Mean of max.	Mean of min.
Cincinnati	.....	.....	30.05	30.25	21st.	29 80	7th.	71	—7	20	89	22d.	53	9th.	81	62
Dayton	3.32	3.07	30.03	30.26	10th.	29.79	7th.	74	—2	9	91	22d.	51	9th.	83	59
Wapakoneta	.....	.....	30.04	30 24	10th.	29.85	29th	71	—2	3	90	*1	46	9 h.	82	53
Greenville	.....	.....	30 04	30.28	10th.	29 81	7th.	68	—5	6	85	22d	50	*2	78	57
Celina	.....	.....	30.03	30.27	10th.	29.80	29th.	69	—3	4	90	*4	49	9th.	79	58
Up'r Sandusky	6.00	6 32	30.02	30.30	10th.	29.81	29th.	70	—1	9	89	22d.	48	29th.	78	55
Findlay	.....	.....	30.02	30.30	10th.	29.80	*6	68	.....	....	90	13th.	44	10th.	79	54
Tiffin	.....	.....	30.02	30.29	10th.	29.80	18th.	69	.....	.....	90	22d.	49	8th	79	61
Wauseon	1.74	2.64	30.03	30.31	10th.	29.77	7th.	68	—4	22	93	22d.	41	27th.	82	53
Montpelier	.....	.....	.....	.....	.....	.....	.....	68	.....	.....	92	22d.	42	*8	81	53
Clarksville	4.92	4.70	30.05	30.27	21st.	29.81	18th.	69	—5	5	88	22d.	50	*10	80	58
No. Lewisburg	2.03	3.96	30.04	30.31	10th.	29 82	2 th	72	—4	9	91	23d.	49	10th.	82	58
Bangorville	.....	.....	30.02	30 30	10th.	29.83	18th.	68	—3	9	95	22d.	47	9th.	83	64
Toledo	.....	.....	30.08	30.35	10th.	29.78	7th.	68	—7	.....	89	13th.	49	*12	78	58
Sandusky	2.77	3.09	30.03	30.30	10th.	29 78	7th.	69	—5	12	92	13th.	53	27th	78	60
Hanging Rock	3.37	1.22	30.03	30.21	21st.	29.79	18th.	68	—4	9	91	14th.	47	9th.	82	58
Portsmouth	.....	.....	30.05	30.27	10th.	29.81	18th.	71	—3	7	93	14th.	52	9th.	84	61
Waverly	.....	.....	30.03	30.30	10th.	29.78	18th.	70	—4	8	95	22d.	44	9th.	87	55
Georgetown	.....	.....	30.04	30.26	10th.	29.82	*6	71	—4	6	93	13th	51	9th.	84	61
Columbus	.....	.....	30.04	30.28	10th.	29.80	18th.	70	—6	12	89	22d.	52	9th.	80	60
O. S. University	.....	.....	30.02	30.27	10th.	29.79	18th.	69	—4	9	89	22d.	49	*17	80	56
Westerville	2.64	2.93	30.01	30.26	10th.	29.80	29th	67	—4	16	88	*4	49	*17	80	57
Logan	.....	.....	30.03	30.26	10th.	29.77	18th.	69	—3	8	92	*19	48	*10	83	57
Oberlin	.....	.....	30.00	30.28	10th	29.76	*6	67	—4	9	90	*20	45	10th.	80	56
Marietta	.....	.....	30.04	30.29	10th.	29.78	18th.	70	—4	9	90	22d.	50	9th.	81	60
McConnelsville	.....	.....	30.03	30.27	10th	29.76	18th.	69	—4	8	88	*21	47	9 h.	80	56
Pomeroy	.....	.....	30.01	30.25	10th.	29 82	7th.	74	—4	8	91	*22	47	9th.	83	57
Athens	.....	.....	30.07	30.29	*7	29 82	1th.	70	—2	3	90	22d.	48	9th.	81	57
Granville	.....	.....	30.01	30.30	10th.	29.80	*6	68	—4	5	87	*23	45	10th.	80	55
Newcomersto'n	.....	.....	30.03	30.29	10th.	29.78	18th	67	—5	6	91	*21	45	9th.	80	55
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	68	—4	7	88	13th.	47	9th.	78	58
Canton	.....	.....	30.01	30 28	10th.	29.76	18th.	68	—3	9	89	*19	48	*25	80	57
Youngstown	0.74	0.80	29.99	30.25	10th.	29.73	18th	68	—4	7	90	14th.	47	*16	78	57
Hiram	.....	.....	30.02	30.29	10th.	29.75	7th.	66	—4	5	86	*28	46	31st.	76	56
Wooster	5.62	2.85	30.04	30.30	10th.	29 78	18th.	68	—3	7	89	12th.	49	*29	81	56
Cleveland (S. O.)	.....	.....	30.03	30.32	10th.	29.77	7th.	71	—1	.....	90	13th.	51	*29	76	60
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	68	—3	9	90	*20	49	9th.	77	59
Akron	1.09	0.19	30.01	30.28	10th.	29.72	18th.	68	—4	5	88	*28	48	9th.	78	57
State—Mean	.....	.....	30.03	30.28	.....	29.79	.....	69	—4	9	90	.....	48	.....	81	57
Highest	.....	.....	30.07	30.35	10th.	29 85	.....	74	—4	.....	95	22d.	53	.....	87	62
Lowest	.....	.....	29.99	30.21	.....	29.72	18th.	67	—3	.....	85	.....	41	27th	76	53
Range	.....	.....	0.08	0.14	.....	0.13	.....	7	—1	....	10	.....	12	.....	11	9

*1—13th and 28th. *2—4th and 10th. *4—13th and 22d. *6—7th and 18th. *7—10th and 21st. *8—9th and 29th. *10—9th and 26th. *12—8th and 27th. *17—7th 9th and 10th. *19—13th, 14th and 22d. *20—13th and 23d. *21—14th and 23d *22—14th, 22d and 23d. *25—9th and 31st. *26—9th, 10th, 26th and 1st. *28—22d and 23d. *29—10th and 31st.

The mean atmospheric pressure, 30.03 inches, was .05 inch above the average, and is the highest mean pressure recorded for July since the opening of the Bureau. The highest barometer, 30 35 inches, occurred at Toledo on the 10th, and the lowest, 29.72 inches, at Akron on the 18th. The mean temperature of the northern section was 68°: of the middle section 69°: of the southern section, 70°, and of the State, 69°. These means are 3°, 4°, 4° and 4° below the averages for the sections and State respectively, and are the lowest July mean temperatures recorded since the opening of the Bureau. The following days were above the normal: 13th, 14th, 21st, 22d and 23d. The greatest departure, 4° above, occurring on the 13th and 22d. Twenty-four days were below the normal, the greatest departure being 12° on the 8th. The maximum temperature of the month, 95°, occurred on the 22d at Bangorville and Waverly, and is the lowest maximum on record for the State. The minimum temperature, 41°, on the 27th, at Wauseon, was accompanied by a light hoar frost. Wauseon and Montpelier reported tender plants damaged slightly by frost in the early morning. The mean of the maximum temperatures was 81°, and of minimum, 57°. The mean daily range of temperature was 22°. The greatest daily range, 43°, occurred on the 6th at Waverly, and the least, 6°, on the 8th at Cleveland. The mean relative humidity, 76 per cent., was 2 per cent. above the average. The

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Fahrenheit.					Relative humidity.	Precipitation—In inches.									Number of days.			Prevailing direction of wind.
Daily range												Snowfall.						
Mean.	Greatest.	Date.	Least.	Date.		Total for m'th including melted snow.	Departure from normal.	Normal.	No. y'rs record.	Average daily.	Greatest in 24 consec. hours.	Total for month	On gr'nd at end of month.	No. days which .01 inch or more fell	Clear.	Fair.	Cloudy.	
19	27	6th.	7	25th.	61	5.13	+2.05	3.08	20	.16	2.43	.....	.....	9	10	15	6	S.E.
21	35	7th.	12	8th.	65	2.43	—0.48	2.91	9	.08	0.90	.....	.....	7	23	6	2	S.W.
29	42	28th.	17	31st.	87	1.54	—0.95	2.42	3	.05	0.65	.....	.....	6	20	4	7	S.W.
20	26	*3	10	8th.	85	1.90	—0.23	2.13	6	.06	0.81	.....	.....	8	16	14	1	S.
21	30	10th.	13	*5	77	2.81	+0.72	2.12	4	.09	0.90	.....	.....	7	20	7	4	S.W.
23	33	12th.	12	18th.	77	2.81	—1.22	3.03	9	.09	0.78	.....	.....	10	18	9	4	S.E.
25	37	10 h.	10	7th.	75	5.30	.....	.....	.....	.17	1.23	.....	.....	8	14	12	5	W.
18	25	*7	10	20th.	68	3.52	.....	.....	.....	.11	1.35	.....	.....	11	22	6	3	N.
29	41	27th.	12	7th.	67	2.36	—1.18	3.54	20	.08	0.86	.....	.....	10	11	17	3	W.
28	40	10th	9	*9	69	1.61	.....	.....	.....	.05	1.06	.....	.....	7	13	16	2	S.W.
22	32	6th.	9	3d.	74	3.42	+1.18	2.24	5	.11	2.57	.....	.....	8	18	11	2	W.
24	33	*11	11	8th.	77	4.05	+0.89	3.16	9	.13	1.20	.....	.....	8	22	8	1	N.W.
28	38	17th.	15	8th.	75	3.92	+1.06	2.86	9	.13	1.92	.....	.....	9	18	9	4	S.W.
20	29	16th.	9	*9	73	3.44	+0.25	3.19	.....	.11	1.00	.....	.....	7	15	11	5	W.
18	27	13th.	7	8th.	67	2.05	—1.16	3.21	12	.10	0.78	.....	.....	7	8	21	2	W.
24	33	*13	15	*14	82	3.85	—0.25	4.10	9	.12	1.42	.....	.....	7	10	16	5	N.E.
23	31	*15	13	28th.	82	3.52	—0.85	4.37	7	.11	1.68	.....	.....	9	15	13	3	S.W.
32	43	6th.	16	18th.	77	4.78	+1.25	3.53	8	.15	3.06	.....	.....	8	18	7	6	S.W.
23	30	*16	8	18th	84	5.44	+1.52	5.44	6	.18	2.50	.....	.....	10	18	4	9	N.W.
20	27	*11	11	18th	64	4.69	+1.20	3.49	12	.15	1.43	.....	.....	12	15	13	3	S.
24	33	6th.	11	*18	73	4.41	+1.53	4.41	9	.14	1.97	.....	.....	10	20	10	1	S.
23	34	12th.	10	18th.	79	5.03	+1.16	3.87	16	.16	2.31	.....	.....	10	19	9	3	S.W.
26	36	*16	9	18th.	78	3.82	—0.89	4.71	8	.12	2.00	.....	.....	6	16	10	5	S.E.
24	37	10th.	10	*18	76	2.87	—0.44	3.31	8	.09	1.12	.....	.....	8	12	15	4	W.
21	37	1st.	10	25th.	71	5.31	+0.47	4.84	9	.17	2.19	.....	.....	14	12	14	5	N.W.
24	33	20th.	9	18th.	84	6.99	+2.75	4.4	8	.23	2.12	.....	.....	11	12	12	7	S.
26	33	4th.	14	18th.	80	3.43	—0.86	4.29	6	.11	1.00	.....	.....	7	22	7	2	W.
24	34	20th.	11	18th.	74	4.92	—0.40	5.32	3	.16	1.75	.....	.....	8	14	8	9	S.W.
25	36	10th.	13	28th.	76	6.89	+3.14	3.75	6	.22	3.04	.....	.....	12	16	12	3	W.
25	35	*24	12	18th.	84	4.79	—0.80	5.59	6	.15	1.35	.....	.....	9	17	10	4	W.
20	29	10th.	8	25th.	82	4.98	+0.65	4.33	7	.16	1.38	.....	.....	12	16	8	7	N.W.
23	34	10th.	10	18th.	.....	5.22	+0.51	4.71	9	.17	1.78	.....	.....	9	21	6	4	W.
21	33	*27	7	7th.	82	3.49	+0.87	2.62	7	.16	1.02	.....	.....	12	13	13	5	S.
20	30	31st.	10	18th.	74	3.45	+0.90	2.55	5	.11	0.73	.....	.....	11	16	11	4	S.W.
25	34	6th.	12	28th.	79	3.28	—0.51	3.79	7	.11	1.01	.....	.....	7	21	7	3	S.
16	26	13th.	6	8th.	70	1.48	—2.40	3.88	.....	.05	0.47	.....	.....	12	20	8	3	N.
18	26	*29	6	8th.	.....	1.66	—1.46	3.12	9	.05	0.56	.....	.....	9	16	11	4	S.
21	32	10th.	8	18th.	77	3.22	+0.31	2.91	5	.10	0.80	.....	.....	10	12	14	5	N.W.
24	33	.....	11	.....	76	3.82	+0.40	3.42	9	.12	.....	.....	.....	7	16	10	5	S.W.
32	43	6th.	17	.....	87	7.53	.....	5.59	.....	.28	3.32	.....	.....	14	25	21	10	.....
16	26	.....	6	8th.	61	1.48	.....	1.59	...	.05	0.50	.....	.....	5	8	.....	1	.....
16	17	.....	11	.....	26	6.05	.....	4.00	.....	.23	2.82	.....	.....	9	17	21	9	.....

*3—2d, 10th and 31st. *5—7th, 5th and 28th. *9—7th and 14th. *11—6th and 11th.
*13—13th and 21st. *14—8th, 18th and 28th. *15—6th and 20th. *16—6th and 13th.
*18—8th and 18th. *3—14th and 22d. *24—10th and 20th. *27—10th and 12th.

mean precipitation for the northern section was 3.12 inches; for the middle section, 4.12 inches; for the southern section, 4.23 inches, and for the State, 3.82 inches. The rainfall was deficient 0.07 inch in the northern section, and in excess in the middle section 0.50 inch, in the southern section 0.73 inch, and in the State, 0.41 inch. Precipitation was general in all sections on the 3d, 4th, 7th, 14th, 18th, 23d, 24th, 27th, 29th and 30th; in the northern and middle sections on the 1st, and middle and southern on the 8th and 28th, and local in all on the 2d, 15th 17th, 19th, 22d and 26th; in the northern and southern on the 25th, and northern and middle on the 6th, 20th and 21st. The greatest precipitation in 24 consecutive hours was 3.80 inches at Zanesville on the 7th and 8th. The greatest monthly precipitation was 8.84 inches at Zanesville, and the least, 1.48 inches, at Cleveland (S.O.) The highest wind velocities reported during the month were 36 miles N. W. at Toledo on the 3d; 24 miles W. at Cincinnati on the 14th; 30 miles S. at Cleveland 23d, and 28 miles W. at Columbus on the 27th. Total monthly movement: Cincinnati, 3,619 miles; Toledo, 5,849 miles; Cleveland, 5,347 miles, and Columbus 4,648 miles. The prevailing direction of the wind was S. W. The percentage of verifications of weather forecasts received from Washington, and distributed to 33 stations, computed from reports of observers, was 87 for weather and 82 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF AUGUST, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—In inches.					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Dep'ture mean from normal.	No. y'rs record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.01	30.22	25th.	29.73	1st.	72	—2	20	92	9th.	51	25th.	81	64
Dayton	.....	.....	29.97	30.24	25th.	29.69	1st.	72	0	9	95	10th.	48	25th.	83	62
Wapakoneta	.....	.....	30.00	30.19	26th.	29.74	1st.	70	0	5	97	6th	46	*4	82	57
Greenville	.....	.....	30.01	30.19	25th.	29.72	21st.	68	0	6	90	*3	48	29th.	78	6[illegible]
Celina	.....	.....	29.99	30.22	25th.	29.69	20th.	71	+1	4	94	9th.	49	28th.	80	62
Up. Sandusky	.....	.....	29.98	30.18	25th.	29.70	1st.	70	0	9	93	9th	46	29th	79	58
Findlay	.....	.....	29.99	30.21	25th.	29.65	20th.	69	+1	2	94	10th.	42	29th.	80	56
Tiffin	.....	.....	29.95	30.15	*4	29.60	20th	69	...	.....	95	10th.	47	29th	81	61
Wauseon	2.06	2.09	29.99	30.21	25th.	29.63	20th.	70	0	22	100	10th	39	29th	83	57
Montpelier	.....	.....	.....	.....	.....	.....	.....	69	....	...	97	10th	40	29th.	81	57
Clarksville	5.29	4.48	30.02	30.24	25th.	29.74	1st.	70	0	5	93	*5	7	29th	82	61
No. Lewisburg	1.00	4.09	30.00	30.21	25th.	29.70	1st.	72	0	9	96	*6	47	*7	82	60
Bangorville	.....	.....	30.00	30.25	25th.	29.69	21st.	69	+1	5	101	10th.	41	29th.	84	57
Toledo	.....	.....	30.02	30.21	25th.	29.66	20th.	70	+1	21	96	10th	46	29th.	79	61
Sandusky	5.29	5.77	30.00	30.20	25th	29.66	20th	72	+2	12	98	9th.	49	29th.	81	63
Hanging Rock	2.31	0.38	29.98	30.17	25th.	29.71	21st.	70	0	9	95	10th.	41	29th.	83	61
Portsmouth	.....	.....	29.99	30.18	25th.	29.74	1st.	72	0	7	95	9th.	48	29th.	83	63
Waverly	.....	.....	30.01	30.25	35th.	29.70	1st.	71	—1	7	99	10th.	44	29th.	87	59
Georgetown	.....	.....	30.00	30.24	25th.	29.74	1st.	71	—1	6	97	10th	54	*10	82	64
Columbus	.....	.....	30.00	30.21	25th.	29.70	21st.	70	—2	13	94	10th.	48	25th	80	62
Westerville	4.00	2.41	30.01	30.24	25th.	29.71	1st.	70	0	9	94	*3	43	29th	81	57
Logan	.....	.....	29.99	30.18	25th.	29.70	21st.	69	—1	8	98	*3	45	*12	83	59
Oberlin	.....	.....	29.96	30.21	25th.	29.66	21st.	68	0	9	96	*3	43	29th.	82	57
Marietta	.....	.....	30.01	30.24	25th	29.71	21st.	71	0	9	92	10th.	48	29th.	81	62
McConnelsville	.....	.....	29.99	30.21	25th.	29.67	21st	70	0	8	91	*3	44	29th.	80	59
Pomeroy	.....	.....	29.98	30.20	25th.	29.71	1st.	73	—2	8	94	*14	43	29th.	83	61
Athens	.....	.....	30.02	30.25	25th.	29.73	21st.	71	+1	4	94	10th.	43	29th.	82	59
Granville	.....	.....	29.93	30.18	25th.	29.65	20th.	68	—2	6	92	*3	44	*3	81	57
Newcomerstown	.....	.....	29.97	30.23	25th.	29.66	11th.	67	—1	6	94	10th.	40	29th.	81	57
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	70	+1	7	92	10th.	45	29th.	79	59
Canton	.....	.....	29.98	30.22	25th.	29.61	21st.	69	+1	7	93	10th.	43	29th	81	58
Youngstown	0.80	0.86	29.98	30.17	25th.	29.64	21st.	69	+1	7	93	10th.	43	29th.	80	58
Hiram	.....	.....	29.99	30.18	25th.	29.62	21st.	68	+1	6	91	9th.	47	*12	78	58
Cleveland (S. O.)	.....	.....	30.00	30.22	25th.	29.64	21st.	70	+1	....	96	9th.	49	29th.	78	61
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	69	+1	9	92	9th.	49	29th.	78	61
Akron	0.79	0.32	20.98	30.21	25th.	29.63	21st.	69	+1	5	93	10th.	46	29th.	78	59
State—Mean	.....	.....	29.99	30.22	.....	29.68	.....	70	0	9	95	.....	46	.....	81	59
Highest	.....	.....	30.02	30.25	25th.	29.74	.....	73	—2	.....	101	10th.	54	.....	87	64
Lowest	.....	.....	29.93	30.15	.....	29.60	20th.	67	0	.....	90	.....	39	29th.	78	57
Range	.....	.....	0.09	0.10	.....	0.14	.....	6	—2	.....	11	.....	15	.....	9	9

*3—9th and 10th. *4—26th and 29th. *5—8th, 9th and 10th. *6—9th and 10th. *7—25th and 26th. *19—25th and 28th. *12—20th and 30th. *13—29th and 31st. *14—10th and 11th.

The mean atmospheric pressure, 29.99 inches, was .03 inch below the average. The highest barometer, 30.25 inches, occurred at Bangorville, Waverly and Athens on the 25th, and the lowest, 29.60 inches, at Tiffin on the 10th. The mean temperature of the northern section was 60°; of the middle section, 70°; of the southern section, 71°, and of the State, 70°. These means are exactly the normal, except that of the northern section, which is 1° above. The following days were above the normal: 5th, 6th, 7th, 8th, 9th 10th, 11th, 12th, 14th, 17th, 18th, 19th 20th, 22d and 27th. The greatest departure, 8° above, occurred on the 9th and 10th. The following days were below: 1st, 2d 3d, 4th, 13th, 23d, 24th, 25th, 26th, 28th, 29th, 30th and 31st. The greatest departure, 7° below, occurred on the 25th. The 15th, 16th and 21st were days with normal temperature. The maximum temperature of the month was 101° on the 10th, at Bangorville, and the minimum, 39°, on the 29th, at Wauseon. The mean of the maximum temperatures was 81°, and of minimum, 57°. The mean daily range of temperature was 22°. The greatest daily range, 41°, occurred at Waverly on the 1st and 7th, and the least, 3° occurred at Cincinnati and Montpelier on the 23d. Light frost was reported from Findlay on the 25th, and from Wauseon, Lordstown and Kenton on the 29th; no damage reported. The mean relative humidity, 73 per cent., was 2 per cent. below the average. The mean precipitation

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Fahrenheit.					Relative humidity.	Precipitation—In inches.									Number of days.			Prevailing direction of wind.
Daily range.												Snowfall.						
Mean.	Greatest.	Date.	Least.	Date.		Totals for m'th, including melted snow.	Departure from normal.	Normal.	No. y'rs record.	Average daily.	Greatest in 24 consec. hrs.	Total for months.	On gr'nd at end of month.	No. days which .01 inch or more fell.	Clear.	Fair.	Cloudy.	
17	24	*1	3	23d.	72	2.83	—1.22	4.05	20	.09	0.81	.....	.....	14	9	14	8	S. W.
21	30	1st.	12	*2	73	3.20	—0.20	3.40	9	.10	0.96	.....	.....	10	11	18	2	S. W.
26	34	26th.	11	23d.	88	2.22	—0.08	2.30	5	.07	1.40	.....	.....	8	21	4	6	S. W.
18	27	8th.	10	24th	90	3.25	—1.02	4.27	6	.10	1.10	.....	.....	11	9	17	5	W
18	28	*9	6	4th.	84	4.05	+1.09	2.96	4	.13	1.15	.....	.....	6	15	10	6	S. W.
21	29	8th.	10	24th.	75	2.43	—0.73	3.16	9	.08	0.65	.....	.....	8	15	11	5	N. E.
24	34	6th.	8	23d.	79	1.90	—0.45	2.35	2	.06	0.35	.....	.....	8	10	16	5	S. W.
20	30	26th.	13	23d.	72	1.60	.....	.....	.....	.05	0.48	.....	.....	9	19	10	2	W.
26	40	6th.	10	23d.	69	3.43	+0.53	2.90	22	.11	1.85	.....	.....	11	9	16	6	S.
24	38	6th.	3	23d.	73	3.91	.....	.....	.....	.13	1.31	.....	.....	8	14	12	5	S. W.
22	31	8th.	8	23d.	79	3.78	—0.71	4.49	5	.12	1.18	.....	.....	12	11	12	8	N.
22	32	*8	9	24th.	78	1.70	—1.77	3.47	9	.06	0.90	.....	.....	9	14	11	6	N. W.
27	40	25th.	12	23d.	76	2.86	—0.66	3.40	5	.09	0.75	.....	.....	9	9	15	7	S. W
18	25	29th	7	24th.	73	1.91	—0.94	2.85	21	.06	0.69	.....	.....	10	14	8	9	W.
18	27	16th.	6	12th.	67	1.53	—1.90	3.43	22	.05	0.59	.....	.....	14	7	17	7	S. W.
22	35	30th.	9	23d.	87	4.49	+0.22	4.27	9	.14	0.74	.....	.....	14	4	18	9	N. E.
20	29	14th.	7	23d.	85	4.18	—0.15	4.33	7	.14	1.42	.....	.....	13	10	13	8	S. W.
28	41	*9	8	23d.	83	3.95	+0.41	3.54	9	.13	0.99	.....	.....	14	8	16	7	S. W.
18	28	*11	5	23d.	86	5.62	+0.68	4.94	6	.18	1.47	.....	.....	12	9	7	15	N. W.
18	28	7th.	9	23d.	70	2.64	—0.77	3.41	13	.09	0.85	.....	.....	16	12	12	7	S.
24	33	*8	11	23d.	82	1.80	—1.02	2.82	9	.06	0.92	.....	.....	10	8	19	4	N. E.
24	37	*8	7	23d.	87	4.80	+0.16	4.64	8	.16	2.14	.....	.....	9	11	12	8	S. E.
25	40	26th.	11	23d.	76	1.25	—0.95	2.20	8	.04	0.45	.....	.....	5	14	15	2	N.
19	29	1st.	11	*2	82	3.21	—1.06	4.27	9	.10	1.10	.....	.....	12	6	15	10	N.
21	31	7th.	9	23d.	81	3.44	—0.64	4.08	8	.11	1.64	.....	.....	10	8	8	15	N.
24	34	*9	13	23d.	89	2.50	—0.57	3.07	8	.08	0.80	.....	.....	7	15	6	10	W.
23	34	*9	12	16th.	80	5.17	+0.83	4.34	4	.17	2.01	.....	.....	10	5	14	12	S. W.
21	38	31st.	12	23d.	84	1.92	—0.14	2.06	6	.06	0.64	.....	.....	10	14	14	3	W.
21	35	29th.	6	23d.	85	3.22	—1.20	4.42	6	.10	1.04	.....	.....	8	13	12	6	W.
20	28	7th.	8	21st.	79	2.85	—1.49	4.34	7	.09	0.57	.....	.....	9	16	9	6	N.
23	32	6th.	8	23d.	.....	2.19	—0.89	3.08	8	.07	0.63	.....	.....	10	15	13	3	S. W.
22	30	22d.	11	*2	84	1.72	—1.32	3.04	7	.06	0.53	.....	.....	7	12	15	4	S.
20	29	27th.	6	23d.	74	2.54	—1.03	3.57	7	.08	0.60	.....	.....	9	20	9	2	W.
16	26	16th.	4	12th	73	2.80	—0.25	3.14	.....	.09	1.21	.....	.....	11	14	14	3	N. W.
17	26	16th.	6	23d.	.....	3.23	+0.55	2.68	9	.10	1.17	.....	.....	9	10	17	4	S.
19	30	6th.	7	23d.	80	2.67	—1.21	3.88	5	.09	0.75	.....	.....	13	13	14	4	S.
22	32	.....	6	.....	73	3.07	—0.27	3.34	9	.10	.....	.....	.....	10	13	11	7	S. W.
28	41	*9	13	.....	90	5.62	+0.68	4.94	....	.....	2.35	.....	.....	16	22	18	17	.....
16	24	.....	3	23d.	67	0.60	—1.46	2.06	.....	.....	0.30	.....	.....	3	4	3	2	.....
12	17	.....	10	.....	23	5.02	2.14	2.88	....	.....	2.05	.....	.....	13	18	15	15	.....

*1—7th, 8th and 9th. *2—23d and 24th. *8—7th and 8th. *9—1st and 7th. *11—7th and 9th.

for the northern section was 2.79 inches; for the middle section, 3.42 inches; for the southern section, 3.81 inches, and for the State, 3.07 inches. The rainfall was deficient 0.45 inch in the northern section; 0.40 inch in the middle section, and 0.27 inch in the State, and in excess 0.04 inch in the southern section. Precipitation was general in all sections on the 3d, 11th, 12th, 14th, 17th 18th, 20th, 21st, 22d, 23d, 24th and 27th; in the middle and southern section on the 16th and local in all on 1st 10th, 15th, 19th and 30th; in the northern and middle sections on 2d, 25th, 28th and 31st, and in the southern section on the 4th, 5th, 6th, and 26th. The greatest precipitation in 24 consecutive hours was 2.35, inches at Gratiot on the 11th and 12th. The greatest monthly precipitation was 5.62 inches at Georgetown, and the least, 0.60 inch, at Bellevue. The highest wind velocities reported during the month were 34 miles N. W. at Cincinnati on the 15th; 26 miles W. at Toledo on the 20th; 26 miles W. at Columbus, and 28 miles S. at Cleveland on the 24th. Total monthly movement: Cincinnati, 3,169 miles; Columbus, 4,095 miles; Cleveland, 5,197 miles, and Toledo, 5,713 miles. The prevailing direction of the wind was S. W. The percentage of verifications of weather forecasts received from Washington, and distributed to 33 stations, computed from reports of observers, was 87 for weather and 94 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF SEPT., 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—In inches.					Temperature—Degrees								
											Max.		Min.			
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Departure mean from normal.	No. years record.	Highest.	Date.	Lowest.	Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.16	30.38	9th.	29.93	3d.	70	+2	20	90	19th.	50	9th.	81	59
Dayton	1.82	1.77	30.15	30.41	10th.	29 91	3d.	69	+4	9	92	19th.	44	9th.	81	57
Wapakoneta	.....	.....	30.15	30.37	9th.	29.92	3d.	68	+3	6	92	*2	40	30th.	81	52
Greenville	.....	.....	30 16	30.40	10th.	29.95	3d.	66	+4	6	85	*2	41	30th.	76	56
Celina	.....	.....	30.14	30.35	10th.	29.96	3d.	66	+3	4	89	*3	46	*4	79	59
Upper Sandusky	4.00	3.86	30.12	30.38	10th.	29.92	3d.	68	+4	9	89	*5	44	*7	79	55
Findlay	.....	.....	30.13	30.40	10th.	29.93	3d.	66	+4	3	92	*9	37	9th.	81	54
Tiffin	.....	.....	30.13	30.38	9th.	29.90	3d.	68	.....	.....	91	27th.	42	30th.	80	57
Wauseon	2.13	3.16	30.14	30.39	30th.	29.90	28th.	67	+5	22	96	25th	37	8th.	83	53
Montpelier	.....	.....	.....	.....	.....	.....	.....	66	.....	.....	91	*2	89	*14	79	53
Clarksville	4.51	4.62	30.17	30.41	9th.	29.93	3d.	67	+3	6	93	26th	42	9th.	82	55
No. Lewisburg	0.80	2.63	30.14	30.43	12th.	29.92	3d.	69	+4	9	94	*16	41	9th.	82	56
Bangorville	.....	.....	30.15	30.42	10th	29.89	3d.	68	+6	5	97	*24	43	9th.	85	56
Toledo	.....	.....	30.17	30.42	10th.	29.94	28th.	69	+6	.....	92	24th	46	8th.	79	59
Sandusky	4.93	4.93	30.14	30.38	10th.	29.93	15th.	70	+6	.....	95	17th.	49	9th.	80	60
Hanging Rock	0.86	0.10	30.12	30.32	10th.	29.93	3d.	66	+2	8	92	*17	44	9th.	83	55
Portsmouth	.....	.....	30.12	30.34	9th.	29.94	3d.	67	+2	8	94	18th.	46	*19	84	58
Waverly	.....	.....	30 16	30.41	9th.	29.93	3d.	67	0	6	99	19th.	42	*19	87	53
Georgetown	.....	.....	30.14	30.38	9th.	29.91	3d.	69	+3	6	96	21st.	46	29th.	84	57
Columbus	.....	.....	30.15	30.39	9th.	29.98	3d.	69	+4	13	92	21st.	45	9th.	81	58
Westerville	2.63	1.66	30.15	30.46	10th.	29 94	3d.	66	+2	9	93	*21	38	9th.	82	52
O. S. University	.....	.....	30.12	30.39	10th.	29.89	3d.	65	+3	15	88	21st.	41	9th.	79	53
Logan	.....	.....	30.16	30.41	10th.	29.96	3d,	66	+2	8	94	*22	42	10th	83	54
Oberlin	.....	.....	30.14	30.43	10th.	29.88	3d.	66	+3	9	92	*23	39	30th.	80	55
Marietta	.....	.....	30.16	30.43	10th.	29.97	13th	68	+2	9	89	21st.	47	*19	80	58
McConnelsville	.....	.....	30 15	30.40	10th.	29.95	3d.	67	+2	8	91	*25	42	10th.	80	54
Pomeroy	.....	.....	30.12	30 34	10th.	29.94	3d.	68	0	8	89	19th.	43	*19	80	53
Athens	.....	.....	30 17	30.43	10th.	29.96	3d.	66	+3	4	91	21st.	42	10th.	81	54
Granville	.....	.....	30.12	30 43	9th.	29.92	3d.	64	—1	7	92	*21	36	9th.	82	50
Newcomerstown	.....	.....	30.15	30.45	10th.	29.94	3d.	65	+3	6	91	*9	38	9th.	81	51
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	69	+5	7	90	27th.	43	9th.	78	56
Canton	.....	.....	30.15	30.42	10th.	29.89	3d.	66	+4	8	90	21st.	41	9th.	79	54
Youngstown	0.53	0.50	30.13	30.41	10th.	29.92	3d.	67	+4	7	91	*27	40	8th.	79	54
Hiram	.....	.....	30.13	30.41	10th.	29.89	3d.	66	+4	7	90	25th.	44	30th.	78	55
Wooster	.....	.....	30.16	30.44	10th.	29.95	13th.	68	+6	7	98	19th.	42	9th.	86	56
Cleveland (S. O.)	.....	.....	30.14	30.42	10th.	29.95	15th	68	+5	21	92	17th.	47	9th.	76	59
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	66	+4	9	92	17th.	46	9th.	77	58
Akron	0.10	0.00	30.12	30.41	10th.	29.89	3d.	67	+5	5	89	*9	44	30th.	78	56
State—Mean	.....	.....	30.14	30.40	.....	29.93	.....	67	+3	9	92	.....	43	.....	80	55
Highest	.....	.....	30.17	30.46	10th.	29.98	.....	67	+3	9	99	.....	50	.....	87	60
Lowest	.....	.....	30 12	30.32	.....	29.88	3d.	64	+2	.....	85	.....	36	9th.	76	50
Range	.....	.....	0.05	0.14	.....	0.10	.....	6	0	.....	14	.....	14	.....	11	10

*2—24th and 25th. *3—18th, 21st, 24th and 25th. *4—9th and 30th. *6—18th and 27th. *7—8th and 20th. *9—21st and 27th. *14—8th, 9th and 10th. *16—26th and 27th. *17—21st and 22d. *19—9th and 10th. *21—20th and 21st. *22—18th, 25th and 26th. *23—20th, 24th, 25th and 27th. *25—21st, 25th and 26th.

The mean atmospheric pressure, 30.14 inches, was 0.07 inch above the nine-year average, and is the highest monthly mean on record for September. The highest barometer, 30.46 inches, occurred at Ohio State University on the 10th, and the lowest, 29 88 inches, at Oberlin, on the 3d. The mean temperature of the northern section was 67°; of the middle section, 67°; of the southern section, 68°, and of the State, 67°. These means are 4, 3, 3 and 3 above the averages for the sections and State respectively. The following days were above the normal: 1st, 2d, 12th, 13th, 16th to 30th. The greatest departure, 14° above, occurred on the 29th. The following days were below: 3d to 10th, 14th, 15th and 31st The greatest departure, 9° below, occurred on the 8th and 9th. The maximum temperature of the month was 99°, at Waverly, on the 19th, and the minimum, 36°, at Granville, on the 9th. The mean of the maximum mean temperatures for the month was 80°, and of minimum, 55°. The mean daily range of temperature was 22°. The greatest daily range, 45°, occurred at Newcomerstown, on the 21st, and the least, 4°, occurred at Greenville on the 5th, and Cleveland (S. O) on the 29th. Light frosts were reported from the northern and middle sections on the 8th, 9th, 10th and 30th; no damage reported. The mean relative humidity, 77 per cent., was the average. The mean

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Fahrenheit.					Relative humidity.	Precipitation—In inches.									Number of days.			Prevailing direction of wind.
Daily range.						Total for month including melted snow.	Departure from normal.	Normal.	No. years record.	Average daily.	Greatest in 24 consec. hours.	Snowfall.		No. days which .01 inch or more fell.	Clear.	Fair.	Cloudy.	
Mean.	Greatest.	Date.	Least.	Date.								Total for month.	On ground at end of month.					
22	29	15th.	7	4th.	74	2.65	+0.28	2.37	20	.09	1 28	.....	.....	7	21	7	2	S. W.
25	32	*	7	4th.	72	1.75	—1.5	2.90	9	.06	1.02	.....	.....	5	20	7	3	S W.
29	39	27th.	21	15th.	84	0.57	—1.61	2.18	6	.02	0.31	.....	.....	3	25	3	2	S. W.
19	26	24th.	4	5th.	90	2.10	-0.70	2.80	6	.07	1.15	.....	.....	4	19	9	2	N.
20	25	*5	10	5th.	79	1.00	—1 21	2.21	5	.03	1.00	.....	.....	1	20	7	3	S. W.
24	33	*8	11	4th.	78	0.45	—2.24	2.69	9	.02	0.20	.....	.....	4	23	3	4	S. W.
27	37	*10	7	5th.	75	0.42	—1.51	1.93	3	.01	0.19	.....	.....	5	21	8	1	S. W.
23	30	*11	9	*12	71	1.71	.....	.....	.....	.06	1.45	.....	.....	5	25	2	3	N.
80	40	*13	9	5th	67	0.86	—1.40	2.26	20	03	0 61	.....	.....	5	17	11	2	S. W.
26	38	16th.	11	*15	73	0.65	.....	.....	.....	.02	0 36	.....	.....	3	26	2	2	S. W.
27	35	26th	6	*12	74	1.80	—0 42	2.22	5	.06	0.48	.....	.....	8	21	5	4	W.
26	36	*11	10	*12	75	0.70	—3.24	3.94	9	.02	0.30	.....	.....	4	20	6	4	W.
29	39	16th.	13	4th.	70	0 81	—2.31	2.52	5	.02	0.30	.....	.....	5	20	8	2	S. W.
20	29	24th.	6	8th.	70	0.84	—1 66	2.50	.....	03	0.59	.....	.....	5	22	5	3	W.
19	33	20th.	6	26th	68	1.10	—2.00	3.10	4	.04	1.64	.....	.....	5	15	12	3	S. E.
28	35	*18	8	4th.	84	2.75	—0.51	3.26	8	.09	1.75	.....	.....	5	3	24	3	N. E.
26	35	10th.	6	4th.	84	2 80	—0.17	2.97	8	.09	1.54	.....	.....	5	19	7	4	S. W.
33	42	*20	7	4th.	80	2.08	—1 28	3.36	6	.07	0.91	.....	.....	9	18	8	4	S. W.
27	40	18th.	5	5th.	82	2.19	—0.90	3.09	6	.07	1.19	.....	.....	5	17	5	8	N. W.
23	31	21st.	5	4th.	66	1.05	—1.76	2.81	13	.03	0.47	.....	.....	6	21	5	4	S.
30	39	21st.	6	4th.	76	1.16	—2 24	3.40	9	.04	0.50	.....	.....	6	18	9	3	S.
25	34	21st.	10	4th.	77	0.76	—2.32	3.12	16	.03	0.41	.....	.....	4	17	8	5	N
29	40	18th.	7	4th.	80	1 60	—2.07	3.67	7	.06	0.53	.....	.....	4	21	5	4	S. E.
25	37	*24	8	4th.	76	2.98	—0.08	3 06	9	.10	2.75	.....	.....	5	20	10	.....	S.
22	30	10th.	5	4th.	83	2.40	—1.03	3.43	9	.08	0.73	.....	.....	7	20	4	6	S.
26	36	18th.	10	4th.	84	2.04	—1.46	3.50	8	.07	0.93	.....	.....	5	15	8	7	N.
26	35	14th	13	*26	85	2.67	—0.07	2.74	7	.09	1.08	.....	.....	5	15	8	7	W.
27	37	18th	5	4th.	81	2 33	—1.61	3.94	4	.08	0.76	.....	.....	4	16	10	4	W.
32	41	20th	6	4th.	74	0.70	—2.99	3 69	7	.02	0.48	.....	.....	7	19	7	4	W.
30	45	21st.	10	4th.	83	1.36	—3.20	4.56	6	.05	0.64	.....	.....	3	20	8	2	W.
22	35	0th	10	*12	77	1.36	—1.97	3.33	7	.05	0.78	.....	.....	5	19	8	3	S. W.
25	36	20th.	9	4th.	.....	1.07	—2.19	3.26	7	.04	0.89	.....	.....	5	19	8	3	S.
25	34	21st	10	6th	83	1.22	—2.19	3 41	7	.04	0.53	.....	.....	6	16	11	3	N.
23	32	20th.	11	4th.	76	1.40	—2.15	3 55	7	.05	0.97	.....	.....	6	19	10	1	S. W.
30	42	23d.	10	4th.	73	0.94	—2.08	3.02	7	.03	0.45	.....	.....	5	18	11	1	S.
17	30	20th.	4	29th	74	2.01	—1.83	3.84	21	.07	1.37	.....	.....	5	17	11	2	S. W.
19	30	20th.	7	4th.	.....	1.71	—2.03	3.74	9	.06	0.92	.....	.....	6	15	12	3	S.
22	34	20th.	9	4th.	80	0.95	—2.42	3.37	5	.03	0.51	.....	.....	6	13	16	1	S.
25	35	.....	8	.....	77	1.50	—1 60	3.10	9	.05	.....	.....	.....	6	20	7	3	S. W.
33	45	21st.	21	13th.	90	3.01	—1.45	4.56	.....	.10	2 75	.....	.....	9	27	24	8	.....
17	26	24th.	4	*28	66	0.31	—1.62	1.93	.....	01	0.14	.....	.....	1	3		.....	.....
16	19	.....	17	.....	24	2.70	+0.07	2.63	.....	.09	2.61	.....	.....	8	24	24	8	.....

*1—3d and 21st. *5—9th, 29th and 30th. *8—16th and 28th. *10—16th and 23d. *11—10th and 24th. *12—4th and 5th. *13—10th, 23d and 24th. *15—3d and 5th. *18—10th and 17th. *20—10th, 21st and 24th. *24—20th and 24th. *26—6th and 15th. *27—18th and 25th. *28—5th and 29th.

precipitation for the northern section was 1.47 inches; for the middle section, 0.97 inches; for the southern section, 2.05 inches, and for the State, 1.50 inches. These means are 1.62, 2.33, 0.85 and 1.60 deficient for the sections and State respectively. Precipitation was general over the State on the 3d, 4th, 5th, 6th, 13th, 15th, and 29th, and local on the 7th, 8th, 11th, 12th, 18th and 28th. The greatest precipitation, locally, in 24 consecutive hours, was 2.75 inches, at Oberlin, on the 5th. The greatest monthly precipitation was 3.01 inches, at Elyria, and the least, 0.31 inch at Marion. The highest wind velocities reported during the month were 29 miles W. at Toledo, and 28 miles S. at Cleveland, on the 15th; 26 miles W. at Cincinnati, on the 28th; 27 miles N. W. at Sandusky, and 26 miles S. at Columbus, on the 29th. Total monthly movement: Cincinnati, 2,533 miles; Columbus, 3,688 miles; Cleveland, 4,963 miles; Toledo, 5,935 miles, and Sandusky, 5,334 miles. The p rcentage of verifications of weather forecasts received from Washington and distributed to 42 stations, computed from reports of observers, was 94 for weather and 94 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF OCTOBER, 1891, FURNISHED

Stations.	Ozone. Monthly mean.		Barometer reduced to sea level—in inches.					Temperature—Degrees									
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	Dep'ture mean from normal.	No. y'rs record.	Max. Highest.	Max. Date.	Min. Lowest.	Min. Date.	Mean of Max.	Mean of Min.
Cincinnati	.....	.....	30.15	30.53	28th.	29.84	4th.	55	−2	20	85	2d.	30	28th.	65	44
Dayton	1.93	1.54	30.17	30.55	28th.	29.73	4th.	53	0	9	89	*1	25	28th	65	42
Wapakoneta	.....	.....	30.14	30.42	12th	29.77	4th.	50	−2	6	87	2d.	26	23d.	61	39
Piqua	.....	.....	.....	.....	.....	.....	.....	52	.....	.....	89	3d.	24	28th.	65	39
Greenville	.....	.....	30.15	30.47	28th.	29.81	4th.	50	+1	6	80	2d.	26	28th.	60	41
Celina	.....	.....	30.19	30.51	12th.	29.85	4th.	53	+2	5	84	2d.	29	28th.	63	43
Up'r Sandusky	2.87	2.71	30.11	30.54	12th.	29.72	4th.	51	0	9	84	3d.	25	28th.	60	38
Fostoria	.....	.....	30.14	30.54	12th	29.74	4th.	51	+1	4	89	2d.	24	28th.	63	40
Findlay	.....	.....	30.12	30.52	12th	29.66	4th	51	+1	4	88	2d.	20	28th.	62	38
Tiffin	.....	.....	30.07	30.47	12th.	29.66	4th	50	.....	.....	86	2d.	26	28th.	61	41
Wauseon	2.53	2.60	30.13	30.52	12th.	29.75	4th.	49	−1	22	88	2d.	20	28th	62	38
Montpelier	.....	.....	30.11	30.53	12th.	29.77	4th.	50	.....	.....	81	3d.	21	23d.	59	38
Clarksville	6.13	6.13	30.16	30.56	28th.	29.74	4th.	52	+1	6	87	2d.	23	28th.	64	41
N. Lewisburg	.....	.....	30.14	30.56	28th.	29.73	4th.	52	0	9	90	*1	22	28th.	65	40
Bangorville	.....	.....	30.17	30.56	12th.	29.71	4th.	50	+2	5	93	2d.	22	28th	64	38
Marion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89	3d.	22	28th.	....	....
Toledo	.....	.....	30.14	30.56	12th.	29.83	4th.	51	−1	.....	86	2d.	27	28th.	60	43
Sandusky	2.87	3.87	30.11	30.53	12th.	29.76	4th.	53	+2	.....	90	2d.	29	28th.	62	44
Hanging Rock	0.45	0.19	30.12	30.48	28th	29.74	4th.	51	−2	7	88	2d.	26	*8	67	39
Portsmouth	.....	.....	30.14	30.41	28th	29.73	4th.	52	−1	8	88	*10	26	28th.	68	41
Waverly	.....	.....	30.16	30.58	28th.	29.74	4th.	51	−3	7	92	2d.	2	28th.	69	38
Georgetown	.....	.....	30.13	30.52	28th.	29.74	4th.	54	+2	6	99	2d.	28	28th	67	43
Westerville	1.39	1.97	30.15	30.52	28th	29.78	4th.	53	−1	13	86	3d.	27	28th	63	42
Columbus	.....	.....	30.12	30.53	28th.	29.70	4th.	50	0	9	86	*1	21	28th.	64	35
O. S University	.....	.....	30.12	30.50	28th	29.68	4th.	49	−2	16	83	2d.	16	23d.	62	39
Logan	.....	.....	30.19	30.57	28th.	29.84	4th.	52	0	9	90	2d.	21	28th.	68	37
Oberlin	.....	.....	30.12	30.56	12th	29.65	4th.	51	+1	9	89	2d.	27	*8	62	40
Marietta	.....	.....	30.14	30.54	28th.	29.76	4th.	53	0	9	84	2d.	28	28th.	65	42
McConnelsville	.....	.....	30.14	30.51	28th.	29.83	4th.	51	−1	8	86	*1	21	28th.	64	38
Pomeroy	.....	.....	30.11	30.51	28th.	29.73	4th.	53	−3	6	86	3d	21	28th	65	38
Granville	.....	.....	30.15	30.53	28th.	29.69	4th.	48	−3	6	87	*10	20	28th.	63	36
Newcomersto'n	.....	.....	30.13	30.51	17th.	29.73	4th.	49	+1	6	86	2d.	21	28th	63	36
N. Alexandria	.....	.....	.....	.....	.....	.....	.....	52	+1	7	83	*10	28	*8	62	40
Canton	.....	.....	30.10	30.53	12th	29.68	4th.	51	+1	8	86	2d.	26	23d.	62	41
Youngstown	0.61	0.61	30.12	30.44	12th.	29.72	4th.	51	0	7	88	4th.	28	28th.	63	40
Hiram	.....	.....	30.11	30.57	12th.	29.69	4th.	49	+1	6	85	2d.	29	28th.	60	40
Wooster	.....	.....	30.14	30.46	12th.	29.70	4th.	49	0	7	88	2d.	25	23d.	61	39
Cleveland (S O)	.....	.....	30.12	30.56	12th.	29.72	4th.	52	−1	21	85	2d.	32	12th	60	44
Cleveland (H.)	.....	.....	.....	.....	.....	.....	.....	52	+1	9	85	2d.	32	23d.	60	44
Akron	0.07	0.00	30.10	30.53	12th.	29.68	4th.	51	+1	5	84	*1	30	23d.	60	49
State—Mean	.....	.....	30.14	30.52	.....	29.74	.....	51	0	9	87	.....	25	.....	63	40
Highest	.....	.....	30.19	30.58	28th.	29.85	.....	55	−2	.....	93	2d.	32	.....	69	49
Lowest	.....	.....	30.07	30.41	.....	29.65	4th.	48	0	.....	83	.....	20	28th.	59	36
Range	.....	.....	0.12	0.17	.....	0.20	.....	7	−2	.....	10	.....	12	.....	10	13

*1—2d and 3d. *2—18th and 22d. *3—10th and 13th. *4—1st and 7th. *5—7th and 20th. *11—1st and 25th. *12—7th and 19th

The mean atmospheric pressure, 30.14 inches, was 0.06 inch above the nine-year average. The highest barometer, 30.58 inches, occurred at Waverly on the 28th, and the lowest, 29.65 inches, at Oberlin on the 4th. The mean temperature of the northern section was 51°; of the middle section, 51°, of the southern section, 52°, and of the State, 51°. These means are the same as the mean averages for the sections and State for the nine years, except the northern section, which is 1 above the average. The following days were above the normal: 2d, 3d, 4th, 14th, 20th, 23d, 24th, 25th, 29th, 30th and 31st. The greatest departure, 13° above, occurred on the 2d and 3d. The following days were below: 1st, 5th to 13th 15th to 20th, 22d, 26th, 27th and 28th. The greatest departure, 11° below, occurred on the 19th. The maximum temperature for the month was 93° at Bangorville, on the 2d, and the minimum, 20°, at Wauseon, Findlay and Granville on the 28th. The mean of the maximum mean temperatures for the month was 63°, and of minimum, 40°. The mean daily range of temperature was 23°. The greatest daily range, 48°, occurred on the 29th at Waverly, and the least, 3°, occurred on the 7th at Toledo, and 19th at Wapakoneta. Severe black frosts occurred over the State on the 23d and 28th. The mean relative humidity, 78 per cent. was normal. The mean precipitation for the northern section was 1.79 inches; for the middle section, 1.88 inches; for the southern section,

THE STATE BOARD OF HEALH BY THE OHIO METEOROLOGICAL BUREAU.

Fahrenheit.					Relative humidity.	Precipitation—In inches.									Number of days.			Prevailing direction of wind.
Daily range.												Snowfall.						
Mean.	Greatest.	Date.	Least.	Date.		Total for m'th, including melted snow.	Departure from normal.	Normal.	No. y'rs record.	Average daily.	Greatest in 24 consec. hrs	Total for month.	On ground at end of month	No. days which .01 inch or more fell.	Clear.	Fair.	Cloudy.	
20	34	17th.	6	19th	70	1.16	—1.57	2.73	20	.04	0.75	.....	.....	8	15	11	5	N. W.
22	36	1st.	10	20th.	73	2.36	—0.08	2.44	9	.08	1.80	.....	.....	5	18	10	3	N.
22	43	1st.	3	19th	84	2.22	—0.20	2.52	6	.08	1.10	.....	.....	4	23	5	2	S. W.
26	40	1st.	14	5th	80	1.50	.....	.....	....	.05	0.50	.....	.....	6	15	3	14	N. W.
19	32	1st.	8	19th.	90	1.09	—0.79	1.88	6	.04	0.46	.....	.....	4	18	10	3	S. W.
20	30	1st.	10	*2	78	0.90	—0.90	1.89	5	.03	0.60	.....	.....	3	18	10	3	S. W.
22	40	1st.	9	29th.	83	3.26	+0.85	2.41	9	.11	1.38	.....	.....	6	15	9	7	S. W.
23	43	2d.	9	18th.	76	2.98	+0.89	2.09	3	.10	1.15	.....	.....	9	16	11	4	S. W.
24	46	1st.	10	19th	81	2.72	+0.36	2.36	4	.09	1.20	.....	.....	6	16	11	4	N. W.
20	40	1st.	8	7th.	75	2.10	.....	.....	....	.07	1.11	.....	.....	6	17	8	6	S.
24	36	*3	7	18th.	73	1.85	—0.85	2.70	20	.06	0.74	.....	.....	10	10	13	8	S. W.
20	36	1st.	4	7th.	76	0.92	.....	.....	.....	.03	0.24	.....	.....	7	16	12	3	N. W.
23	35	1st.	6	19th	72	1.58	—0.60	2.18	6	.05	0.54	.....	.....	6	12	15	4	S. W.
25	42	*4	6	19th.	75	2.15	—0.26	2.41	9	.07	1.00	.....	.....	6	17	7	7	S. W.
26	41	13th.	10	*5	74	2.39	+0.04	2.35	5	.08	1.09	T	.....	6	14	10	7	S. W.
.....	38	17th.	10	*6	.....	3.72	.....	.....	.....	.12	1.30	T	.....	6	9	7	15	N. W.
17	26	17th.	3	7th.	70	2.47	—0.33	2.80	.....	.08	0.91	.....	.....	7	13	9	9	N. W.
18	31	*7	5	18th.	66	2.64	—0.26	2.90	.....	.09	1.21	.....	.....	11	7	13	11	S. W.
29	45	*9	5	19th.	82	1.14	—1.74	2.88	7	.04	0.42	.....	.....	8	6	18	7	E.
26	42	29th.	6	19th.	82	0.91	—1.26	2.17	9	.03	0.49	.....	.....	6	17	9	5	S. W.
31	48	29th	6	19th	77	1.56	—0.97	2.53	8	.05	0.29	.....	.....	8	20	5	6	S. W.
24	42	29th.	4	19th.	82	2.02	—0.72	2.74	6	.06	1.03	.....	.....	7	14	9	8	S.
21	34	17th	7	22d	68	2.94	+0.03	2.91	13	.10	1.60	.....	.....	9	7	16	8	S.
26	43	17th	8	19th.	75	2.79	+0.24	2.55	9	.09	1.62	.....	.....	8	17	8	6	S
23	37	1st.	9	20th	78	2.66	+0.25	2.41	16	.09	1.25	.....	.....	6	17	7	7	S.
30	45	29th.	7	20th.	85	1.47	—1.28	2.75	9	.05	0.61	.....	.....	5	13	12	6	S. E.
22	44	1st.	7	*6	78	1.53	—0.54	2.07	9	.05	0.67	.....	.....	5	17	8	6	S. W.
23	36	17th.	7	20th.	78	1.69	—1.19	2.88	9	.06	0.70	.....	.....	6	14	9	8	S.
26	42	25th.	8	20th	84	1.50	—0.94	2.44	8	.05	0.65	.....	.....	8	15	7	9	S.
27	40	26th.	7	20th.	86	1.59	+0.04	1.55	6	.05	0.42	.....	.....	10	22	3	6	W.
27	44	17th	8	20th.	78	2.30	—0.49	2.79	6	.07	1.10	.....	.....	10	15	8	8	S. W.
27	39	*9	8	20th.	79	1.10	—1.21	2.31	6	.04	0.34	.....	.....	6	14	10	7	W.
22	33	27th.	7	20th.	76	1.06	—1.75	2.81	7	.03	0.29	T	.....	4	17	6	8	S.
21	33	*11	9	27th.	.....	1.13	—1.57	2.70	8	.04	0.21	.....	.....	11	14	8	9	S. W.
24	43	2d.	9	18th.	82	0.99	—1.66	2.65	7	.03	0.30	T	.....	9	13	11	7	N.
20	34	1st.	9	7th.	78	1.37	—1.46	2.83	6	.04	0.44	.....	.....	8	11	8	12	S. W.
22	36	1st.	8	7th.	80	1.33	—1.40	2.73	7	.04	0.45	.....	.....	8	14	10	7	S.
16	31	25th.	4	27th.	76	1.72	—1.24	2.96	21	.06	0.41	.....	.....	12	8	8	15	S. W.
16	31	25th.	6	22d.	.....	1.99	—0.97	2.96	9	.06	0.65	.....	.....	11	12	10	9	S.
19	33	1st	8	7th.	83	1.45	—1.06	2.51	5	.05	0.53	.....	.....	11	12	10	9	S. W.
23	38	.....	7	.....	78	1.76	0.89	2.65	9	.06	.....	T	.....	10	10	9	12	S. W.
31	48	29th	14	.....	90	3.72	+0.21	3.51	.....	.12	2.00	.....	.....	12	22	18	15	.....
16	26	.....	3	*12	66	0.54	—1.01	1.55	.....	.02	0.17	.....	.....	3	6	2	3	.....
15	22	.....	11	.....	24	3.18	+1.22	1.96	.....	.10	1.83	.....	.....	9	16	16	12	.....

*6—18th and 20th. *7—2d and 25th. *8—23d and 28th. *9—25th and 29th. *10—3d and 4th.

1.61 inches, and for the State, 1.76 inches. These means are 0.87, 0.70, 1.12 and 0.89 deficient for the sections and State respectively. Precipitation was general over the State on the 4th, 5th, 7th, 14th, 18th, 19th, 20th and 21st, and local on the 6th, 8th, 15th, 22d, 26th and 27th. The greatest precipitation, locally, in 24 consecutive hours was 2.00 inches at Bellevue on the 19th. The greatest monthly precipitation was 3.72 inches at Marion, and the least, 0.54 inch, at Demos. Almost the total precipitation for the month fell on six days, the 4th, 7th, 14th, 18th, 19th and 20th. The remainder of the month was very dry. The first snowfall of the season was noted at Bangorville, Marion, New Alexandria, Youngstown, Hiram, Ashland, Garrettsville, Orangeville, Gratiot and Demos on the 23d and 27th inst. The highest wind velocities reported during the month were 36 miles W at Sandusky on the 26th; 33 miles S. at Cleveland on the 29th, and 28 miles S. W. at Columbus on the 31st. The prevailing direction for the month was S. W. The percentage of verifications of weather forecasts received from Washington and distributed to 50 stations, computed from reports of observers, was 92 for weather and 94 for temperature.

CHAS. M. STRONG, *Sec'y O. M. Bureau.*

TABLES SHOWING

Day and Night Observations for Ozone,

TAKEN BY

MEANS OF SCHŒNBEIN'S TEST PAPER.

RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

November, 1890	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	3	2	2	3	5	6	1	1	2	3	2	1	2	2	6	6	4	3	4	6	4	6	4	6	2	0	4	3	3	2	7	7
Dayton	0	0	0	0	0	0	0	0	0	1	2	2	1	3	4	3	2	4	1	6	2	6	3	0	0	0	0	0	0	6	7	3
Hanging Rock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	2	0
North Lewisburg	0	0	2	1	1	1	0	1	0	2	2	3	2	2	.....	2	1	1	2	1	0	2	1	0	1	1	1	0	1	1	1	2
Sandusky	1	1	0	1	1	1	1	0	0	0	0	0	1	0	2	2	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1
Upper Sandusky	3	3	4	4	5	3	3	3	4	4	5	5	5	3	2	3	3	3	3	3	4	3	3	3	3	3	3	2	3	5	5	3
Wauseon	1	3	3	2	2	2	2	0	1	1	1	1	2	3	2	2	2	2	2	2	2	2	1	2	2	1	1	1	2	3	3	3
Westerville	0	0	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	2	0	0
Wooster	1	1	3	1	3	5	2	3	2	0	2	0	2	0	4	5	1	0	3	5	4	2	3	0	0	0	2	0	0	0	3	5
Youngstown	1	0	0	1	2	2	2	1	3	2	1	1	2	2	1	1	1	1	0	1	1	1	1	1	2	1	2	0	1	2	1	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

November, 1890—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Clarksville	3	3	3	3	2	2	3	2	2	1	2	4	3	3	3	3	2	2	4	4	2	4	4	5	2	2	5	1	3.17	3.20
Dayton	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0.77	1.27
Hanging Rock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.07	0.17
North Lewisburg	1	2	2	0	1	0	1	0	1	2	3	1	2	1	0	1	2	1	2	0	0	0	0	1	0	0	1	0	0.93	1.10
Sandusky	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0	0	0	1	0	0	0.47	0.43
Upper Sandusky	2	3	4	4	5	5	4	5	5	4	5	4	5	4	5	5	5	3	4	4	4	4	5	3	5	2	3	3	3.93	3.53
Wauseon	1	3	1	2	1	2	2	1	2	2	1	1	1	1	2	3	2	2	1	1	2	2	2	2	1	1	2	2	1.67	1 83
Westerville	1	5	2	0	1	2	0	0	2	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.40	0.59
Wooster	0	0	2	6	3	3	3	5	2	0	3	3	2	2	2	0	3	2	3	3	5	4	1	0	1	0	6	0	2.37	1.87
Youngstown	0	0	1	2	2	1	1	1	2	2	2	1	1	2	2	1	0	1	1	1	0	0	1	2	3	1	1	1	1 23	1.17

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

December, 1890	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	5	4	4	3	4	3	4	4	3	3	3	1	4	5	5	6	5	2	2	3	2	1	2	3	3	2	3	3	3	1	6	7
Dayton	1	1	1	0	0	0	0	0	1	0	0	4	2	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Hanging Rock	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
No. Lewisburg	0	2	2	1	1	0	0	0	0	0	0	1	1	2	2	0	1	0	0	0	0	1	1	1	0	1	0	0	0	1	1	0
Sandusky	1	1	1	1	0	2	0	1	0	0	0	0	1	2	2	3	2	0	1	1	0	1	1	1	0	0	1	0	1	0	1	0
Upper Sandusky	2	3	4	4	4	5	5	3	4	3	3	4	5	4	4	3	4	3	4	3	3	3	4	3	4	4	3	3	3	4	2	3
Wauseon	4	2	1	3	2	2	2	3	2	2	2	2	2	1	3	1	2	1	2	1	2	2	2	2	1	1	2	1	2	1	2	3
Westerville	0	2	1	0	1	0	1	0	0	0	1	2	1	1	0	0	0	0	0	0	1	2	1	0	1	0	0	0	1	0	0	0
Youngstown	1	0	0	0	1	1	1	2	1	1	0	0	0	2	1	0	1	2	2	0	1	1	0	1	2	2	1	1	0	0	2	2

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

December, 1890—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
Clarksville	7	7	5	6	5	4	4	5	6	6	2	4	2	3	2	2	4	4	4	5	5	7	4	2	3	4	4	3	7	7	3.87	3.93
Dayton	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	2	3	3	0	0	0	0	0	0	0	0	1	2	7	0.42	0.84
Hanging Rock	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	5	0	0	1	0	0	0	0	0	0	0	0.13	0.42
No. Lewisburg	0	3	3	0	1	0	0	0	0	0	0	0	0	0	0	2	2	3	2	0	0	0	1	0	0	0	1	0	0	1	0.61	0.61
Sandusky	0	0	1	3	1	1	0	0	0	1	0	0	0	1	0	0	1	0	0	2	1	0	0	3	0	0	0	0	0	0	0.52	0.78
Upper Sandusky	2	3	3	2	4	2	3	2	5	3	3	3	5	4	4	4	5	3	4	3	4	5	4	4	5	3	4	3	2	3	3.71	3.29
Wauseon	4	3	2	2	2	2	2	4	3	2	2	1	1	2	2	1	2	2	2	3	2	2	2	2	2	1	2	2	2	2	2.09	1.90
Westerville	3	3	2	1	0	0	0	1	0	0	1	1	1	0	0	0	0	1	1	2	2	3	2	2	1	0	1	0	0	2	0.74	0.74
Youngstown	1	1	0	0	1	1	2	1	1	0	0	1	2	1	1	1	2	2	0	0	1	2	1	1	2	1	1	1	0	1	0.93	0.93

TABLE SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

January, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Clarksville	7	8	3	3	4	5	3	3	4	4	5	1	3	4	5	6	2	1	5	6	7	7	5	7	7	6	3	4	3	4	5	5
Hanging Rock	0	0	0	0	0	4	0	2	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandusky	1	1	2	1	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	1	2	0	2	5	1	2	0	0	0	0	0	1
Upper Sandusky	4	4	2	3	4	3	3	5	4	5	3	2	3	3	3	3	4	3	3	2	2	3	4	3	4	4	6	6	6	5	5	4
Wauseon	3	2	3	2	3	1	2	2	2	3	3	2	3	2	2	3	2	1	2	2	2	2	3	2	2	2	2	1	2	3	3	3
Westerville	1	3	1	2	0	1	3	1	0	0	2	0	2	2	0	0	0	0	0	0	0	1	1	1	0	1	1	0	1	0	1	0

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

January, 189.—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Clarksville	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4.12	4.59
Hanging Rock	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.09	0.32
Sandusky	1	0	0	0	1	1	0	0	0	2	0	1	1	0	0	2	0	0	0	0	1	1	0	0	1	1	0	0	1	0	0.55	0.63
Upper Sandusky	3	2	5	4	3	3	5	5	3	2	5	3	5	4	5	5	6	5	4	3	6	4	2	2	3	4	6	4	3	4	4.00	3.61
Wauseon	3	2	3	3	3	2	3	2	3	2	3	2	2	2	2	1	1	1	2	2	1	1	1	3	2	3	2	2	3	3	2.36	2.07
Westerville	2	3	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0.61	0.58

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

February, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	....	....	....	....	....	....	....	....		....	....	....	....		..	....	....	....	....	..	....	....	....	....	....	....	....	....	....	.	....	....
Dayton	0	0	0	0	0	0	0	0	1	1	1	6	5	2	3	5	5	0	0	0	1	0	0	0	0	0	0	0	3	4	3	0
Hanging Rock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
North Lewisburg	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	2	0	0	1	2	0	1	2	4	0
Sandusky	0	0	0	4	0	3	0	1	1	6	0	0	1	1	2	5	1	4	1	0	0	0	0	0	1	0	0	0	1	0	0	1
Upper Sandusky	5	5	6	4	6	3	3	3	5	5	5	2	4	4	5	3	3	5	5	4	5	5	5	6	5	5	5	5	6	3	2	3
Wauseon	4	2	2	3	3	2	1	1	1	2	2	....	....	....				...	....	....	....	...	....	...	....	....	.	....	....	....	....	....
Westerville	1	1	0	0	1	0	1	0	1	0	0	0	0	2	0	0	0	..	....	....	....	....	....	....	....	....	....	.	....	....	....	....
Wooster	4	6	3	5	6	6	3	5	2	0	2	0	1	1	6	7	0	0	5	5	1	0	1	0	0	0	5	6	1	1	1	5

TABLE SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RE ORDED ACCORDING TO A SCALE OF TEN DE GREES OF COLORATION

Febr a y, 189:—*Concluded*..	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day	Night.	Day.	Night.	Day	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.....	.....	.....	.....	.....	.....	0.00	0.00
Clarksville	.....	.....	.....	.....	.....	.....	.....		7	8	7	7	5	6	7	6	8	8	7	8	6	7	8	8	.....	.....	.....	.....	.....	.....	2.71	2.78
Dayton	3	1	0	5	6	5	3	4	0	0	0	0	0	4	4	6	0	0	0	0	0	0	0	0	.....	.....	.....	.....	.....	.....	1.34	1.46
Hanging Rock	0	0	0	4	1	0	0	0	0	2	0	0	0	0	0	3	2	4	1	5	2	2	1	0	.....	.....	.....	.....	.....	.....	0.25	1.82
North Lewisburg	1	0	1	0	2	3	3	4	4	0	1	0	1	0	0	3	2	0	1	0	1	1	1	1	.....	.....		.....	.....	.....	1.00	1.15
Sandusky	2	7	0	0	1	1	0	5	0	3	0	3	0	0	1	1	2	5	1	2	0	0	0	1	.....	.....	.....	.....	.....	.....	0.50	1.68
Upper Sandusky	3	3	2	4	4	2	2	4	7	7	7	7	7	6	7	6	7	7	6	6	6	4	4	3	.....	.....	.....	.....	.....	.....	4.89	4.78
Wauseon	.....	.....	.....	.....	.....	.....	.....	.....		3	3	4	3	3	6	7	7	4	6	6	5	7	6	5	.....	.....	.....	.....	.....	.....	3.77	3.77
Westerville	.....	.....	.....	.....	.....	4	2	4	4	7	7	0	1	2	5	1	2	7	6	6	2	2	5	1	.....	.....	.....	.....	.....	.....	2.11	2.10
Wooster	3	4	5	6	4	4	0	1	6	7	4	5	1	0	3	1	8	7	8	8	8	8	8	7	.....	.....	.....	.....	.....	.....	3.25	3.96

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

March, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	7	7	6	6	7	0	8	8	5	7	4	6	5	7	7	[illegible]	7	8	6	6	5	6	8	8	7	8	6	7	6	6	4	4
Dayton	2	5	6	0	0	0	1	0	0	4	6		6	7	6	[illegible]	1	0	3	[illegible]	3	6	1	[illegible]	2	1	0	1	2	1	1	6
Hanging Rock		6	1	8	1		2	7	1	7	1	0	0		[illegible]	7	0	2	3	0	0	0	0	0	0	6	0	6	1	1	0	4
North Lewisburg	2	[illegible]	3	3	3	2	2	1	0	4	3	2	1	1	3	1	1	0	0	0	0	0	1	2	1	0	0	0	1	0	1	2
Sandusky	1	0	0	1	0	0	0	0	0	0	1	4	2	2	[illegible]	[illegible]	1	1	1	1	2	1	7	8	4	7	1	3	1	1	4	8
Upper Sandusky	4	4	[illegible]	3		6	7	5	6	7	6	6	7	7	[illegible]	[illegible]	6	6	5	6	6	6	5	[illegible]	6	7	6	7	8	6	6	7
Wauseon	4	4	3	8	7	6	4	7	3	5	6	5	5	6	[illegible]	6	3	5	3	3	3	6	3	6	7	4	4	3	3	4	4	3
Westerville	2	1	1	0	2	8	8	2	2	4	1	2	2		0	5	4	4	2	1	1	1	2	8	5	7	4	0	2	3	6	6
Wooster	6	1	3	4	3		8	8	7	6	6	6	7	7	5	7	8	8	6	7	1	1	3	6	5	6	3	4	3	2	5	3
Youngstown	0	0	1	0	1	1	2	1	1	0	0	0	0	0	1	1	1	1	2	1	1	0	0	0	1	1	1	1	0	0	1	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

March, 1891—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day	Night.	Day.	Night.	Day	Night.	Day.	Night	Day.	Night.	Day	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night	Day	Night.	Day	Night.	Day.	Night.	Day.	Night.	Day	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0.0	0.00
Clarksville	6	7	5	5	7	8	5	7	7	7	8	8	1	6	5	7	5	7	6	5	7	7	7	8	5	7	6	4	6	8	6.32	6.71
Dayton	5	2	0	6	1	5	2	4	5	0	0	4	4	5	1	8	3	5	4	8	6	7	5	3	3	3	4	7	0	1	3.33	3.58
Hanging Rock	0	2	0	0	0	0	0	0	0	0	4	[illegible]	0	0	2	6	3	6	0	7	0	7	3	0	0	0	0	1	0	5	0.87	3.16
North Lewisburg	2	[illegible]	0	0	3	2	3	0	0	2	2	3	0	1	1	3	4	1	[illegible]	3	4	3	4	1	2	3	1	3	4	1	1.71	1.58
Sandusky	1	6	1	1	4	6	1	4	2	3	5	8	1	5	1	2	3	8	2	7	4	7	[illegible]	9		3	0	2	1	2	1.77	3.90
Upper Sandusky	7	3	7	8	6	7	7	6	7	6	5	5	7	4	7	8	8	8	7	8	7	8	6	5	7	7	5	7	5	7	6.13	6.39
Wauseon	2	4	4	7	8	6	3	6	6	5	5	2	3	3	3	5	4	6	3	6	9	7	4	4	2	2	4	6	5	4	4.32	4.97
Westerville	[illegible]	0	0	6	1	1	1	0	0	6	5	8	2	0	3	7	6	3	1	7	1	6	3	7	1	2	4	4	5	6	2.55	3.77
Wooster	3	2	4	1	6	6	0	1	5	1	7	6	6	7	3	0	4	5	2	2	5	6	4	6	4	1	1	2	3	6	4.39	1.16
Youngstown	2	1	1	1	0	0	0	0	1	1	1	0	0	0	1	[illegible]	2	1	1	1	0	0	0	1	1	1	1	2	1	1	0.80	0.61

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

April, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	6	5	8	7	6	8	7	7	7	7	7	8	6	7	6	6	7	6	7	7	7	8	6	7	6	6	8	7	7	7	6	7
Dayton	2	5	6	1	1	3	5	4	2	5	3	1	4	1	2	6	6	7	5	6	.....	5	2	1	1	6	1	1	2	1	5	4
Hanging Rock	0	0	0	5	0	5	0	6	0	2	0	7	2	0	0	3	0	0	2	0	0	2	2	0	0	0	0	0	3	2	0	0
North Lewisburg	1	1	1	3	2	1	1	1	2	4	5	0	1	1	1	1	1	1	2	2	4	0	0	4	0	2	2	3	2	1	1	2
Sandusky	1	1	1	3	4	8	4	9	2	3	1	1	3	0	2	1	1	2	5	2	1	4	8	4	1	0	4	2	2	3	1	6
Upper Sandusky	7	7	6	8	7	7	6	8	7	8	7	3	5	5	6	6	7	8	8	8	7	8	8	7	7	8	8	7	7	7	8	6
Wauseon	4	4	3	4	5	4	4	4	3	4	6	3	2	3	2	3	5	6	3	4	4	4	3	4	2	3	5	5	5	5	3	6
Westerville	4	0	1	3	4	4	3	7	3	5	6	3	3	1	2	2	1	2	4	6	4	6	3	0	0	2	5	6	7	3	5	0
Wooster	2	2	2	0	6	7	6	6	4	5	1	0	3	0	2	0	3	1	2	2	4	2	4	6	1	1	1	1	3	4	...	.....
Youngstown	1	1	0	0	1	0	1	1	1	0	0	0	1	1	0	1	1	1	0	1	1	2	1	1	0	0	0	1	1	2	1	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

April, 1891—*Concluded*.....	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron.....	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	.....	.....	0 00	0.20
Clarksville.....	6	6	7	7	6	6	6	7	4	4	7	8	.....	.....	.....	.....	.....	.....	.....	.....	4	5	5	6	4	5	5	4	.....	.....	6 19	6.46
Dayton	1	6	.....	3	2	5	4	3	2	7	3	4	2	4	2	0	0	0	1	2	2	3	2	0	0	0	2	0	.....	.....	2.50	3. 3
Hanging Rock..	2	0	1	0	6	5	4	3	0	0	2	2	5	6	3	5	4	0	5	5	0	6	3	6	2	0	0	4	.....	.....	1.53	2.47
North Lewisburg	2	4	3	1	2	3	3	1	2	2	4	2	3	3	4	1	2	2	2	4	2	2	2	3	1	2	2	1	....	.....	2 00	1.93
Sandusky	0	2	2	4	1	3	2	6	1	4	4	6	2	4	3	8	2	0	4	1	3	1	2	4	4	2	2	3	.....	.....	2 43	3.23
Upper Sandusky.....	7	9	8	7	8	8	7	6	7	8	8	8	7	7	6	5	6	6	7	7	7	7	6	5	5	6	6	7	.....	....	6 90	7 07
Wauseon.....	3	5	4	3	4	5	3	4	2	3	3	5	3	5	4	5	3	4	2	2	2	3	3	3	3	2	2	4	.....	.....	3 33	3.93
Westerville	2	7	6	0	5	5	4	4	5	6	7	5	4	5	4	0	3	2	1	0	3	3	3	1	2	5	4	7	.....	.....	3 60	3.33
Wooster	....	....	.....	.....	....	.....	....	....	.....	....	.....	.....	....	....	.....	.....	....	.....	5	2	3	1	4	5	5	1	5	4	.....	.....	2 20	1.67
Youngstown.....	1	2	1	1	1	1	1	2	1	1	1	1	2	1	1	1	2	2	1	2	1	1	0	1	2	2	1	2	.....	.....	0.90	1.10

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

May, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	1	0	1	0	1	0	1	0	0	0
Clarksville	7	7	4	5	7	8	5	6	6	6	5	5	5	6	5	6	3	5	5	5	6	7	5	6	5	5	8	7	7	7	6	7
Dayton	0	2	2	6	4	0	0	0	0	0	0	0	0	1	1	2	1	2	0	5	5	4	0	0	....	....	1	1	....	3	2	1
Hanging Rock	3	6	2	7	7	....	4	4	5	6	3	....	2		2	....	2	1	3	...	5	6	4	7	2	2	....	6	3	7	6	7
New Lewisburg	2	2	0	1	2	2	2	4	3	2	3	1	1	3	2	2	4	1	3	3	5	1	3	2	3	3	4	2	3	3	3	2
Sandusky	2	4	2	2	2	8	2	2	1	5	1	4	3	1	4	5	6	6	5	6	3	5	2	1	2	0	2	0	3	0	4	4
Upper Sandusky	7	6	6	8	5	7	6	5	4	5	4	5	6	4	6	7	6	6	6	7	6	5	4	4	3	5	7	4	7	6	5	5
Westerville	3	2	...	.	...	0	5	6	4	5	2	0	3	0	2	0	3	.....	6	7	4	3	5	7	4	6	6	7	4	7	..	.....
Wooster	4	8	5	2	8	8	6	2	6	8	7	8	6	0	6	0	5	6	5	6	7	7	5	0	5	1	6	5	4	2	6	7
Youngstown	1	1	1	0	0	0	1	1	2	1	1	1	0	1	1	1	0	0	0	1	1	1	1	1	1	1	0	1	1	2	2	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

May, 1891—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	1	7	1	0	0	3	1	0	0	0	0	0	1	0	0	0	1	4	0	0	0	0	0	0	0	0	0.37	0.49
Clarksville	6	6	4	6	6	5	7	7	7	7	6	6	7	8	7	7	7	7	7	7	5	6	7	6	6	6	6	6	5	5	6.00	6.22
Dayton	1	0	1	1	....	6	5	6	4	3	2	6	4	4	4	3	1	1	6	5	4	4	..	7	3	2	4	1	1	1	2.07	2.57
Hanging Rock	6	2	3		....	3	2		2		4	6	3	7	6	....	2		6	7	2	8	5	4	2	...	6	...	4	...	3.42	3.[illegible]9
New Lewisburg	4	2	3	1	2	3	3	3	3	4	5	4	6	0	1	4	5	3	6	1	6	4	6	4	6	2	4	2	2	2	3.40	2.45
Sandusky	2	2	3	2	2	4	6	6	4	6	0	8	1	5	2	4	6	2	2	7	2	7	1	5	2	7	4	6	3	2	2.80	4.06
Upper Sandusky	5	6	7	6	7	7	7	7	6	5	6	8	6	7	7	7	7	8	6	7	6	6	6	8	8	5	7	5	7	7	6.10	6.[illegible]9
Westerville	..	0	1	0	3	6	7	8	6	2	6	3	6	5	4	0	6	6	7	7	5	5	7	7	5	2	4	3	4	0	4.[illegible]2	3.70
Wooster	6	5	3	4	3	4	6	7	7	8	7	7	7	9	6	6	6	1	5	6	5	7	7	7	7	10	6	4	5	5	5.77	5.19
Youngstown	1	1	1	1	0	1	1	0	0	1	2	1	1	0	1	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	0.77	0.77

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

June 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	2	0	0	0	0	0	0	1	2	0	0	4	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Clarksville	5	6	5	7	5	3	6	6	7	6	6	7	7	7	6	4	5	4	3	3	5	6	4	6	6	6	5	5	6	4	4	2
Dayton	5	2	4	0	4	7	3	6	.....	4	.....	6	5	6	3	2	1	2	2	3	3	5	4	5	.....	0	0	3	5	2	3	5
Hanging Rock	2	0	3	0	2	0	0	6	1	6	0	1	2	6	4	3	4	2	2	.....	0	4	5	4	3	3	4	0	2	0	1	0
Sandusky	4	4	4	3	5	2	0	2	4	6	1	5	6	8	4	9	7	5	2	2	2	2	2	5	3	2	1	1	3	2	3	4
Upper Sandusky	7	8	7	7	7	6	7	6	6	6	7	8	7	7	7	6	6	6	6	7	7	6	5	5	6	5	6	5	5	6	6	7
Wauseon	2	3	3	2	3	4	4	4	2	3	5	4	3	4	3	3	2	3	2	3	2	3	2	3	2	3	2	3	2	2	2	2
Westerville	3	1	5	0	6	3	4	8	5	3	4	5	4	6	2	.....	.....	.....	.....	.....	.....	.....	.....	6	4	2	3	1	4	0	2	0
Wooster	5	6	6	6	0	1	6	6	5	7	6	6	7	7	5	7	5	6	6	5	5	1	3	6	6	2	5	2	3	2	5	2
Youngstown	1	1	0	0	0	0	1	2	1	2	1	1	0	1	1	0	0	0	0	0	1	1	2	1	2	2	1	1	0	0	2	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER. RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

June, 1891.—*Concluded*.....	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	1	0	0	0	2	0	.....	.....	0.43	0.20
Clarksville	5	7	5	4	6	4	7	5	7	7	6	5	7	7	5	5	5	5	5	4	6	6	4	5	5	4	.....	.....	.....	.....	5.47	5.17
Dayton	2	..	.....	1	2	5	5	7	5	2	3	5	3	4	2	.....	1	1	1	5	....	.....	1	4	2	4	3	10	.....	....	2.88	3.55
Hanging Rock	3	0	4	1	4	0	0	0	0	0	1	0	5	3	4	1	4	0	0	1	5	6	6	0	3	3	0	0	.....	.....	2.56	1.66
Sandusky	1	2	1	8	2	5	2	4	1	3	5	5	4	5	3	3	2	1	3	4	2	2	2	2	1	1	1	1	.....	.....	3.43	3.60
Upper Sandusky	6	7	5	8	5	6	6	7	7	6	6	5	5	5	6	6	5	5	6	6	6	6	5	6	5	6	6	6	.....	.....	6.17	6.17
Wauseon	3	3	4	5	3	2	3	1	2	1	2	2	2	2	2	2	2	2	1	2	2	3	2	1	2	3	2	3	.....	....	2.70	2.70
Westerville	4	2	2	2	4	0	6	2	3	0	4	3	4	4	2	2	3	0	2	6	.....	.....	.....	.....	5	1	5	3	....	.....	3.75	2.50
Wooster	6	1	3	1	2	4	6	1	6	6	6	3	6	8	6	5	4	1	5	1	5	6	5	6	6	6	5	5	...	....	4.96	4.20
Youngstown	1	2	2	1	2	2	0	0	1	1	2	1	1	1	1	0	0	1	1	1	1	0	0	0	1	1	2	1	.....	.....	0.93	0.83

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

July, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	2	0	1	0	2	0	0	0	0	4	3	6	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	0
Clinksville	....	....	....		..	....	....	....	4	5	5	5	5	5	5	8	5	7	5	6	5	6	4	5	3	4	5	3	6	7	4	5
Dayton	1	1	1	7	3	2	1	1	1	1	1	4	4	7	...	5	2	3	4	1	1	2	3	2	4	2	....	....	...	1	....	2
Hanging Rock	4	1	3	2	4	0	2	2	3	0	3	0	2	7	7	0	3	0	4	0	2	0	3	0	3	0	3	0	4	0	4	0
North Lewisburg	1	3	0	2	4	4	4	6	4	3	1	4	2	3	7	5	1	3	5	4	0	3	0	3	1	3	3	4	2	5	2	4
Sandusky	1	2	1	1	2	7	3	2	2	3	1	2	4	3	2	5	2	2	1	0	4	2	4	2	1	2	2	3	0	4	1	0
Upper Sandusky	6	6	6	8	6	5	7	7	6	7	7	7	6	7	6	6	6	5	6	7	6	6	6	7	6	7	7	5	6	5	5	6
Wauseon	1	2	2	4	2	2	2	2	2	3	1	4	4	4	3	3	2	2	1	4	1	2	2	2	2	1	2	3	2	1	1	2
Westerville	2	3	3	7	3	3	2	6	4	2	3	4	4	2	2	5	4	2	3	2	2	2	2	1	1	2	3	5	3	2	2	2
Wooster	....	....	....	....	....	....	7	5	6	7	5	5	7	7	6	2	5	1	4	1	4	1	5	2	6	2	6	3	5	1	5	3
Youngstown	1	1	0	1	2	1	1	1	0	0	0	1	1	1	0	2	1	1	1	1	1	0	0	0	1	1	2	1	1	1	1	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

July, 1891—*Concluded.*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	4	0	0	0	3	0		0	3	0	3	0	1	2	1	0	0	0	0	0	1	0	0	0	3	0	1	0	1	0	1.04	0.19
Clarksville	3	5	5	4	6	7	4	6	6	6	2	5	5	3	6	6	6	5	4	4	4	6	7	5	5	4	7	7	7	7	4.92	4.71
Dayton	6	5	6	3		2	5		2	3	4	4	4	3	3	5	3	1	4	3	4	...	6	1	5	6	....	5	5	4	3.32	3.07
Hanging Rock	3	4	4	0	6	4	2	2	3	3	0	1		2	4	0	4	2	4	3	2	2	5	0	3	0	2	1	6	6	3.37	1.22
North Lewisburg	0	5	1	6	3	1		4	2	4	0	4	2	3	5	5	2	4	1	3	2	3	3	6	0	4	4	6		3	2.03	3.96
Sandusky	4	5	3	4	4	2	3	1	3	2	2	4	3	4	5	6	4	6	4	5	2	4	6	5	4	2	4	4	4	5	2.77	3.09
Upper Sandusky	6	7	7	7	6	6	7	7	6	7	7	7	7	8	6	7	5	5	6	6	5	6	5	5	5	6	5	6	5	5	6.00	6.32
Wauseon	1	3	2	3	2	3	2	3	1	3	1	2	2	3	2	3	2	3	1	3	1	2	2	1	2	4	2	3	2	2	1.71	2.64
Westerville	1	1	1	3		0	3	5	3	4	2	1	4	8	3	5	3	2	2	1	4	2	2	0	3	6	4	6	2	2	2.64	2.93
Wooster	5	2	6	3	6	2	5	1	5	2	6	4	6	6	7	6	6	2	6	1	4	....	.....	0	6	7	7	0	6	1	5.62	2.85
Youngstown	1	1	1	1	1	1	0	0	1	1	0	0	1	1	0	1	1	0	1	2	1	1	1	0	0	1	1	1	1	1	0.74	0.80

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

August, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	3	0	5	0	0	0	1	0	0	0	0	0	1	0	2	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0
Clarksville	7	7	6	3	7	7	6	6	6	7	4	4	6	5	4	4	4	4	3	3	4	4	7	7	7	6	3	3	6	6	6	2
Dayton	.....	0	3	6	5	.....	3	2	2	1	1	4	2	4	3	2	5	3	5	2	3	4	.....	3	3	2	3	5	5	4	6	6
Hanging Rock	1	1	5	5	5	1	2	0	3	0	3	0	0	0	0	0	3	0	2	0	1	1	0	0	2	0	2	0	0	0	2	0
North Lewisburg	1	3	8	6	3	4	4	4	0	6	1	2	0	2	0	5	3	4	2	4	1	3	1	5	0	4	0	2	0	6	0	5
Sandusky	6	5	4	7	5	5	5	3	6	4	5	5	5	5	5	4	7	6	4	5	5	6	5	3	5	3	8	5	7	9	6	6
Wauseon	2	3	3	4	3	3	2	2	2	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	1	3	2	2	3	2	2
Westervilie	3	2	4	5	4	4	3	4	2	4	3	1	2	0	3	4	3	2	2	1	4	2	4	0	5	.....	.....	.....	.....	.....	.....	.....
Wooster	6	7	7	6	5	4	6	1	6	0	5	0	5	1	5	5	5	5	5	1	6	4	7	0	6	2	6	2	7	1	6	1
Youngstown	1	1	0	0	0	1	1	2	2	1	1	1	0	1	1	0	0	0	1	1	2	2	2	1	1	1	1	0	0	.....	1	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

August, 1891—*Concluded*.....	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.79	0.32
Clarksville	4	2	5	6	6	2	6	3	6	5	5	3	6	6	6	6	6	1	7	7	4	2	5	7	5	3	5	6	2	2	5.[illegible]9	4.48
Dayton	5	2	4	1	6	.....	5	4	2	0	4	2	3	5	3	0	3	2	3	.....	4	4	.....	.....	.....	.....	.....	.....	.....	.....	3.50	2.72
Hanging Rock	0	0	1	0	1	0	1	0	0	0	3	0	2	0	0	0	2	0	0	0	0	0	3	0	3	0	2	0	2	0	2.31	0.33
North Lewisburg	1	3	1	3	0	5	1	4	1	5	0	5	2	5	2	3	1	3	0	2	0	4	2	4	1	4	0	5	0	4	1.00	4.09
Sandusky	6	6	8	4	6	6	5	6	6	8	5	3	3	6	4	2	5	1	3	3	3	1	6	5	4	4	6	7	6	3	5.29	5.77
Wauseon	2	2	3	3	2	1	2	3	1	1	2	1	2	3	2	1	2	1	2	1	3	4	2	1	2	4	3	2	2	1	2.06	2.09
Westerville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.00	2.41
Wooster	7	1	6	1	6	7	6	7	7	0	6	7	7	3	6	0	6	0	5	0	6	7	5	0	5	0	6	1	6	0	5.90	2.22
Youngstown	2	1	0	0	1	1	0	0	1	1	0	1	1	2	1	1	0	0	1	1	1	.....	0	1	1	2	2	1	0	.....	0.80	0.86

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

September, 1891.	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	5	6	3	3	4	3	6	6	1	5	6	7	5	4	7	7	4	6	....	...	....	.....	....	....	6	2	7	6	5	6	5	4
Dayton	.....		..	....	.....	.....	....	...	..	....	...	...	2	5	4	3	3	1	1	0	2	.	2	0	0	0	2	3	2	0	0	1
Hanging Rock	2	0	0	0	0	0	1	0	0	0	2	0	1	0	0	0	2	0	1	0	0	0	0	1	2	1	2	0	1	0	0	0
North Lewisburg	1	2	1	5	0	4	1	2	1	2	1	5	0	3	1	2	0	6	0	4	0	3	1	3	1	6	4	2	2	2	1	2
Sandusky	5	1	5	5	5	4	1	6	1	7	6	5	5	2	5	7	6	2	5	5	4	4	5	3	7	6	4	5	7	7	4	5
Upper Sandusky	4	5	4	4	4	4	3	3	3	4	4	2	5	4	4	2	3	2	3	4	3	2	4	5	5	4	3	4	4	3	4	4
Wauseon	3	2	2	2	2	2	2	3	2	2	2	2	3	1	1	1	1	1	2	3	2	1	2	2	3	2	2	1	2	1	2	2
Westerville	2	0	3	0	2	6	3	1	4	1	3	0	5	2	4	0	3	0	1	0	2	0	3	1	2	4	3	2	1	0	2	2
Youngstown	1	1	2	1	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	0	....	0	0	0	1	0	1	1	1	0

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

September, 1891—*Concluded*	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month	Average night for the month
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night	Day.	Night.	Day.	Night.	Day.	Night	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night	Day.	Night		
Akron	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	....	....	0.10	0.00
Clarksville	4	4	5	2	3	2	5	4	5	3	5	3	5	6	5	5	4	5	5	4	4	4	4	4	7	7	7	7	....	....	4.51	4.62
Dayton	3	1	0	2	1	0	1	1	2	2	...	...	3	0	0	1	1	2	3	1	3	4	3	6	4	2	0	4	....	....	1.82	1.77
Hanging Rock	0	0	0	0	0	0	2	0	1	0	1	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	...	....	0.86	0.10
North Lewisburg	1	1	1	1	0	2	0	0	0		0	2	0	2	1	4	0	2	2	0	0	4	2	3	2	2	0	2	....	...	0.80	2.63
Sandusky	6	5	8	6	2	7	4	3	6	5	4	1	6	5	4	5	8	7	3	5	5	7	6	5	6	7	5	6		....	4.93	4.93
Upper Sandusky	4	3	1	4	4	5	5	4	5	4	4	5	5	5	4	4	1	4	5	5	4	5	5	4	3	3	4	5	...	....	4.00	3.86
Wau eon	2	2	2	3	3	3	2	3	2	3	2	2	2	3	2	2	2	2	3	4	2	1	1	4	3	3	3	2	....	..	2.13	4.16
Westerville	3	0	2	6	3	5	2	1	2	0	3	4	4	3	2	2	1	1	2	1	3	2	3	6	4	2	2	4	...	....	2.63	1.66
Youngstown	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	0	1	1	...		1.53	0.50

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

October, 1891	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville	7	7	6	6	5	5	5	3	7	7	6	7	6	7	7	6	6	6	6	6	7	7	7	7	7	6	5	7	6	5	6	5
Dayton	.....	2	5	0	5	3	3	6	.....	....	5	.....	.....	..	...	0	3	0	1	0	4	5	3	1	3	2	1	0	1	0	0	0
North Lewisburg	0	0	0	0	0	0	1	3	3	0	0	2	1	0	0	0	0	0	0	0	3	0	1	0	1	0	1	0	1	0	0	0
Sandusky	4	3	6	5	6	2	4	5	4	9	5	8	2	7	6	10	5	9	4	2	8	8	1	9	1	3	1	2	1	1	1	1
Upper Sandusky	5	4	5	4	4	4	4	5	3	2	2	2	2	2	3	3	2	2	2	2	3	4	3	2	3	3	3	2	3	2	3	2
Wauseon	1	1	1	2	2	2	3	3	3	1	2	4	5	5	2	1	3	1	3	3	3	3	2	3	.....	.....	.....	3	3	2	2	2
Westerville	2	4	3	0	1	3	4	7	3	0	1	4	4	7	2	1	2	0	1	0	3	4	0	2	1	1	1	2	1	0	1	0
Youngstown	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	1	1	1	2	1	1	0	0	1

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

October, 1891—*Concluded*.....	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.07	0.00
Clarksville	6	6	7	7	7	7	6	7	6	6	7	7	6	7	4	6	6	5	6	6	6	6	6	6	6	6	5	5	6	5	6.13	6.13
Dayton	4	6	2	4	1	1	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	...	1	3	0	1	1	4	5	...	1.93	1.54
North Lewisburg	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0.38	0.19
Sandusky	2	2	2	3	3	2	1	1	2	1	2	5	1	1	1	1	1	1	2	1	1	1	1	1	1	1	8	8	2	7	2.87	3.87
Upper Sandusky	3	4	3	3	2	2	1	2	2	2	3	2	2	2	2	2	3	2	2	3	2	2	3	3	3	3	4	3	4	3	2.8	2.71
Wauseon	3	3	2	3	4	3	4	2	2	4	2	5	3	2	2	3	3	3	2	3	2	3	3	2	2	2	3	2	4	2	2.53	2.60
Westerville	0	1	0	5	0	8	1	0	0	5	4	1	0	1	0	0	0	0	2	4	2	0	0	1	1	0	0	1	3	4	1.39	1.97
Youngstown	1	0	0	1	1	0	1	0	1	1	2	1	0	1	1	1	1	1	1	2	1	1	2	1	0	1	1	1	0	0	0.61	0.61

REPORT ON THE CONDITION AND SURROUNDINGS OF THE DELAWARE, OHIO, RUN.

By Edward T. Nelson, M. A., Ph. D.,

Member of the State Board of Health.

In the days of the Roman empire the humblest citizen had the right of appeal to Cæsar. In our day a case in law may be carried through the several courts until the Supreme Court of the United States is reached. Matters of exceptional nature may be taken at once to this—the highest court in the world. The subject before us to-day comes somewhat in the nature of an appeal. It is not sent to us by the City Council, nor yet by the local board of health of the city of Delaware. It comes from citizens living upon the banks of the run or who have property interests involved.

The problems are not new to the writer. They have been considered more or less constantly for the past twenty years from the standpoint of a citizen of Delaware, and while a member of the local board, as also since becoming a member of this board. Prolonged and careful study has been given to the subject during the past month owing to local discussions in the daily papers, and in anticipation of a petition which was being circulated and signed.

It was charged that the run had become an open sewer; that the odors from the same were intolerable; that the health of citizens was endangered, and that the value of all property was depreciated.

The investigations were undertaken without bias or special theory, and with a perfect willingness to accept facts when the same were discovered. It was also expected that the results would form a contribution to the general survey of the water question now being conducted by the board.

The Location.

The city of Delaware, west of the Olentangy river, is built upon two plateaus with the valley of the Delaware run lying between them. From Lincoln avenue the crest on the north to University avenue the crest on the south is almost exactly two-thirds of a mile, measured as the arrow

flies. Upon these two slopes are to be found many of our most beautiful streets, both for residence and for business. The soil is the boulder or glacial clay, very compact on the north, shading off to a sandy loam on the east, and so thin at the south that the underlying limestone is only well covered. The natural drainage of the city is and must always be towards the valley of the Delaware run.

Source of the Stream.

This stream heads in the south-western part of Troy township, crosses the line of Radnor, but soon after, turning to the east, enters Delaware township in the north-west corner. From thence it flows south easterly and reaches the corporation line of Delaware city west of Monnett Hall of the Ohio Weslyan University. From this point the natural course of the stream has been changed somewhat to suit the necessities of the city. It crosses the south-west corner of the Monnett Hall grounds, then flows in an easterly direction, parallel to and in places less than one hundred and fifty feet north of William street, until the grounds of the West school building are reached. Here it enters an arched tunnel and once more emerges to the light on the east side of Liberty street, just south of its intersection with William street. From this point it flows in what might be considered the alley between William and Spring streets and enters the Olentangy river east of the grounds of the Ohio Weslyan University. Its course through the city is at least a mile in length. As a stream, it is as variable as one of the rivers of Colorado. Its drainage slope broadens out to a width of nearly two miles, and extends many miles to the north-west. After a heavy fall of rain the stream is a raging torrent, filling its bed and often overflowing its banks. In mid summer the bed would be entirely dry if it were not for a few springs just west of the city. The extreme variation in the volume of water will explain the difficulty of the problems. As a friend expressed it to me the other day, the Delaware run does not run at all in summer. You will notice that the stream receives all the surface drainage, and from its position in an alley in the rear of a double row of lots, it is liable to receive drainage from stables, pig-pens and cess-pools. In fact, until positively forbidden by our local health officers, it was a custom with our worthy citizens to build their closets with the seat overhanging the stream. It is quite possible that secret connections exist to this day. Changing the course of the stream within the city limits has added a new and very serious factor to the problem. To the west the stream flows along tilled fields and becomes loaded with sediment. Shortly after entering the city the velocity of the current is so checked that much of this sediment is deposited. This impedes the flow of water, especially in the summer, and

changes the stream into a succession of stagnant pools—breeding places for miasm and other zymotics. Again, this rich deposit is a most fertile soil for weeds of various names and the several forms of water and marsh grass.

Such especially has been the case during the long continued drought of the present autumn. In many places the weeds have obscured the bed and covered it entirely from sight. The city authorities have added another factor. Until the introduction of a water system with pumps and standpipe, a little over two years since, Delaware depended for fire protection upon cisterns, the Olentangy river and the Delaware run. To overcome the inconstancy in this latter stream, dams were thrown across the bed at all street intersections. These, however, will soon be removed.

As a proper preliminary to the present study I took a carriage drive along the upper reaches of the stream. I found this one to be neither better nor worse than an average stream in farming districts. Barns and other out-buildings for the most part are near the road on the crests of the hills on either side, and few buildings are found in the valley though all the drainage is in that direction. The fields nearest the creek are devoted to grazing rather than to direct farming. This is made necessary by the sudden and frequent overflows.

I followed the course of the stream on foot through the city, as I have often done in former years, and desire to place before this board the facts as I discovered them.

Monnett Hall.

Monnett Hall has a bad reputation in this connection, and therefore a very special examination was made of the building and all forms of drainage. This large building is the boarding hall for young ladies, and contained at the time of my visit two hundred and twenty-five inmates. This number includes teachers living in the building and the kitchen service. Two systems of water-closets are in use. In what is known as the old building the dry earth system is employed. Excreta, earth and ashes are received into a vault cemented on sides and bottom and without outlet. At regular intervals this material is carted into the country and placed upon a field which has been rented for this purpose. In the recent addition to the building the Bennett & Peck system of hot air closets is in use. Here the excreta, after becoming thoroughly desiccated is thrown into the fire-box and is consumed. The collections of the past week were being destroyed at the time of my visit. The work was satisfactory and without offense. The closets are on the several floors, conveniently arranged and highly sanitary. The kitchen refuse is gathered in large iron cans

and taken out to edge of the grounds where hogs are kept. The following substances are allowed to enter the run: First, the washing or rinse-water; secondly, the water from the bath-tubs—there are no water-closets other than as described above; third, water from the kitchen laundry. This is used simply for table linen; the general laundry for students and teachers is not on these grounds, though pupils are permitted to use the laundry on Saturday for washing such articles as fine handkerchiefs and laces. The superintendent of the laundry informed me that she thought that ten to fifteen barrels of water a week entered the run from this source. Fourth, bed-room slops—these contain urine—to what extent it is not possible to ascertain. The convenience of general closets, the fact that the rooms must be used by pupils both as study and sleeping rooms, restricts this source of danger to a minimum. Assuming, however, that the use of the night-pass is general, a fair calculation would show that not more than twenty-five gallons of liquid sewage is received from the entire building daily. Fifth, water from the elevator—examination of the meter shows a consumption of nearly or quite ten thousand gallons a day. This is obtained from the pipes of the Delaware Water Company, and enters the run in exactly the same condition as when received.

Hence, there is discharged into the run from this establishment each day ten thousand gallons of pure water and a variable quantity—estimated at one thousand gallons—from both room and laundry containing, perhaps, twenty-five gallons of urine.

The present arrangements have the approval of the local board of health.

The Course Through the City.

Following the course of the run through the grounds of Monnett Hall, and east to the intersection of Elizabeth street, there is not much to be said. There are no houses on the north side, and those on the south are at an elevation of twenty to forty feet. Two barns are dangerously near, but I did not observe any thing in the stream that could have come from them; the manure piles in both cases being south of the barns, but as the ground slopes towards the run washing must take place during dashing rains. The privy at No. 210 West Williams street is at the foot of the hill upon which the house is built, and perhaps thirty feet from the bed of the stream.

It is without vault and unboarded below the seat. The deposit could be plainly seen from the street. This is so situated that any washing from the hill above must carry more or less of this filth across the lower

end of the lot and into the run in the rear. Throughout this section of the stream tall weeds have been allowed to grow to such an extent as to obscure the bed of the stream. Many of these have fallen into the water and are rotting there. Crossing Elizabeth street by arched culvert we are in the rear of No. 206 West Williams—the home of the gentleman who is most active in the present agitation. His premises are in good order, though the water in a small pond appeared too green for sanitary purity. The run is within twenty feet of his dwelling and presents any thing but an attractive appearance. It is here that much of the sediment is first deposited, and the bed of the stream is a mat of water-grass. This grass should be removed at once and a channel opened through for the passage of the water.

Garbage Deposited.

At the intersection of Williams street with Catherine street parties unknown to the writer have deposited many loads of ashes mixed with tin cans and garbage. There is no bridge across Catherine street. The land is low and requires filling, but not with matter so unsightly or so unsanitary. The city authorities are to be blamed for permitting this dumping ground to exist. From this point to the east side of Liberty street the run flows in an arched culvert, the major portion of which has been built by the Delaware Board of Education. The work is well done and is ample in size. From its appearance at the time of my visit I should think that the school children entered it more frequently than is wisest on sanitary grounds. I observed also that some broken stone had been left by the workmen in the bed of the stream. Their removal would increase the velocity of the water in this portion of the run. From Catherine street to Sandusky or Main street, a distance of four blocks, the stream has cut its bed down to the solid stone and no reason can be urged why this portion of the bed should not be kept free from mud, filth and debris of all kinds. The bed is somewhat uneven but this could be improved at very slight expense. It will be noticed later in this report that little complaint is made by families dwelling along this section of the stream.

Sewers Entering the Stream.

Near the junction of the run with Sandusky street a sewer enters from the north. This is a storm water sewer only, as is supposed; but a few connections have been made with kitchen sinks. On the east side of same intersection a sewer enters from the south This belongs to the Brewey and drains away all the waste matter from that establish-

ment.* One hundred feet further east a sewer enters from the north. This is the drainage from the city building and opera house. This building contains the lock-up, rooms for fire department, offices for mayor, clerk and council. All water-closets are connected with the run by means of the sewer before named. I have been unable to see how the city is in position to enforce sanitary laws and to attempt an improvement of the condition of the run while refusing to abate the greatest nuisance along the course of the stream.

In this section of the stream the bed is sand and gravel and the current very slow and irregular. It is three feet from the mouth of the brewery sewer to the present stage of water and fully four feet from the city building sewer to the water line.

From Sandusky street east the run forms the north boundary of the Ohio Wesleyan University. Along a portion of the north side of the run at this place a public spirited citizen, Professor G. W. Michael, has erected a series of seven dwellings facing the university campus. He has improved the run by opening out the channel, but has offset it all by constructing what is known as the "Row sewer." Still further east the stream flows through a stretch of bottom land and soon enters the Olentangy by a wide mouth and delta.

I have been thus minute in describing the run, first in order that the members of the State Board may have a clear understanding of the situation, and again because I have felt that the time has arrived when this board should undertake the full investigation of the streams in Ohio and their relation to the public health. The Delaware run is probably one of hundreds of streams in the State, similarly situated and equally dangerous to health and life.

Special Investigations.

This discussion of the Delaware run in the public print and also on the street was such as to make an investigation necessary. I selected those streets and alleys which were most clearly related to the stream. This district covered twenty-five city blocks. With the kind assistance of a number of students of the Ohio Wesleyan University, I made a house to house canvass.

One hundred and eleven houses were visited, which contained at the time eight hundred and ten inmates, or almost exactly one-eleventh of the population of the city of Delaware.

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*Since writing this report the owners of the brewery have made an assignment and the establishment is not running.

The district embraced the south side of Williams street and the north side of Spring street from the Olentangy river on the east to the western limits of the city, including all cross or intersecting streets.

The following list of questions was placed before each family and answers requested, with such additional remarks as might have a bearing on the case.

The several enumerators were instructed to record the exact language of the answer.

1. Explain why the information is called for. (This was a direction to the enumerators).
2. Name of the family and street number of the house.
3. Number of inmates, including students and hired help.
4. Have you had cases of sickness during the year?
5. Nature of the disease.
6. Number of cases.
7. Number of deaths.
8. Do you think the disease was produced or aggravated by the Delaware run?
9. Have you observed any special or unpleasant odors from the run during the past summer?
10. Have you house or cess-pool connections with the run?

For greater accuracy, as also for the sake of comparison, the territory was divided into subdistricts as follows:

1. Williams street—River to Union street.
2. Williams street—Union to Franklin street.
3. Williams street—Franklin to Liberty street.
4. Williams street (north side)—Liberty to, and thence north to the stone quarry.
5. Spring street (north side)—Sandusky to Liberty street.
6. Henry street (both sides) Spring to Williams.
7. Michael Place and Union street from Spring to Williams.
8. Franklin street (both sides) Spring to Williams.
9. Washington street from Spring to Williams and Liberty street, 250 feet north and south from Williams.
10. Catherine and Elizabeth streets from the run north to Williams.

The 810 inmates of the one hundred and eleven houses in the several districts report *sixty-three* cases of illness during the past year, with three deaths. The cases, as reported, are as follows:

Malaria	20 cases.
La grippe	13 cases.
Chronic invalidism	5 cases.
Rheumatism	4 cases.
Typhoid fever	3 cases.
Bad colds	3 cases.
Heart disease	2 cases.
Diabetes	2 cases.
Old age	2 cases, 1 death.
Inflammation of the bowels	2 cases.

Diphtheria	2 cases.
Hemorrhage of kidneys	1 case.
Consumption	1 case, 1 death.
Scarlet fever	1 case.
Croup	1 case.
Typho-pneumonia	1 case, 1 death.

When asked the question, "Do you think the disease was induced or aggravated by the Delaware run?" families reporting thirty cases of sickness answered in the affirmative, and those reporting thirty-three cases answered in the negative. It may be worth placing on record the fact that the friends of the three decedents are positive that the disease and death were not due to the run.

An analysis of the returns has proved quite interesting. Williams street from the river to Liberty street very naturally divides itself into three sections—an eastern, a middle and a western section. The eastern extending from the river to Henry street, is low, quite closely built up with one and a half and two story frame dwellings, occupied in part by renters. The second section reaching to Washington street, is on higher ground with better buildings—for the most part of brick—and occupied by the owners. In the western section the houses are again frame, small, crowded and occupied by renters.

Families in the first and third sections make great complaints and report many cases of sickness; those of the middle section do not report sickness as resulting in any way from the run. Eight families in the eastern section report eight cases of sickness, eighteen in the middle section report six and nine families in the western report ten cases. I will leave it to wiser heads to divide the blame properly between the run, the locality, the character of the houses, the ground space and the habits of the people. I can not do it.

The prevailing winds in Delaware are from the north-west, hence the dwellings south of the run should show a greater amount of sickness than those on the north side if the run is the source of disease. Two hundred and twenty-four people on the north side report twenty-four cases. Eighty-five on the south report nine. No decided percentage in either direction. The cross streets report two hundred and fourteen people, twenty-seven cases of sickness and the three deaths. We find here a slight increase in the percentage of sickness. No lesson can be drawn from the cases of death. I am well aware that these statistics are of little value without a comparison made with another district of equal population in another part of our city. The only comparison at hand is our death rate. Three deaths in a population of eight hundred is phenomenal. I desire, in closing this long report, to call your attention to the legal questions involved. The deeds show that the entire run is

private property, as much so as the ground on which a man builds his house. Many of our citizens accept this legal relation and take great pride in keeping the bed of the run free of filth at their own expense. Their names are not upon this paper which has been sent to this board. One of our citizens has spent time enough in soliciting names to this petition and in working up the agitation to keep the run in the rear of his premises clean for the next five years.

Again, the city, while asserting that this run is private property, has so graded its streets as to throw all the storm-water from a large district into its bed; it has constructed a storm-water sewer from the north draining another large territory; it has constructed a sewer from its own city building; it has thrown dams across the bed of the stream in order to secure fire protection.

Still further, the city has secured in former years from the County Commissioners the admission that the Delaware run is a township or county drain, and that the care of its bed should fall to the charge of the entire county. In some former years all the accumulated debris has been removed, as I understand, by the County Commissioners. This year that board declined to accept this view of the case. While awaiting the unraveling of the tangle the city did nothing, the county did nothing, but the hot weather and the drouth did a great deal. The odor was not a sweet smelling savor. The citizens most deeply interested appealed to the council, and the council referred the matter to the local board of health. This was in August last. The local board decided that the run must be cleaned, but that it would not be wise to disturb the filth and mud during the extreme hot and dry weather, and not until a good rain had once more filled its banks and sweetened its waters. And there the case hangs to-day.

FIRST DISTRICT.

122 East William.
- 2. I. Darst.
- 3. Four.
- 5–6. One case rheumatism.
- 8. No, sir.
- 9. Yes. We are obliged to keep the doors shut.
- 10. No.

118 East William.
- 2 Mrs. S. C. Donnaw.
- 3. Three.
- 4. No, sir.
- 9. No.
- 10. No.

116 East William.

2. J. H Fauber.
3. Nine.
4–6. Two cases of typhoid or malaria.
8 Yes. Yet I do not like to say so; I consider the Olentangy river by far the greater cause.
9. Yes, sir.
10. No.

110 East William.

2. George H. Aigin & Co. (laundry).
3 Nine.
4–8 No.
9. None.
10. None.

104 East William.

2. George H. Aigin (residence).
3. Six.
4–5. Heart disease—one case.*
8. No, sir, it was not.
9. No, sir.
10. No.

100 East William.

2. Mrs. H. Kent.
3. Five.
4. Oh! my, yes.
5. Typhoid fever last fall, one case; diabetes, one case.
8. Yes, of course.
9. Yes, when damp, especially.
10. No.

96 East William.

2. William Strickler.
3. Six.
4–6. One case. Chronic diarrhœa.
8. Don't know that it does.
9. Yes, in the morning.
10. No, sir.

94 East William.

2. Dr. A. E. Main.
3. Five.
4–8. No.
9. Well, sometimes; but I have not thought any thing of it.
10. None.

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* Mr. Aigin has since died.

80 East William.
2. Rev. Father P. S. Style.
3. Two.
4–10. None.

70 East William.
2. Mrs. E. R. Thompson.
3. Four.
4–6. Diabetes and old age. One case.
8. Oh! My, no.
9–10. No.

58 East William.
2. Samuel Strawser.
3. Twelve.
4–6. Two cases. Combination. Invalids.
8. Oh, no, not at all.
9–10. No.

52 East William.
2. Thomas Halloran.
3. Five.
4–10. None.

46 East William.
2. Mrs. Rev. Becker.
3. Fourteen.
4–10. None.

SECOND DISTRICT.

40 East William.
2. Mrs. Russell.
3. Twelve.
4–8. No.
9. A very bad odor when the run gets low; sometimes they close the windows towards evening.
10. No.

28 East William.
2. Mr. N. Wagner.
3. Six.
4–8. No.
9 A slight smell once or twice during summer
10 No.

26 East William.
2. Mrs. Dr. Goldrick.
3. Two.
4–10. None.

20 East William.

2. John Sanderson.
3. Four.
4–6. One case of heart failure and lung trouble.
7–10. None.

13 West William.

2. M. G. McElroy.
3. Two.
4–8. None.
9. They have noticed peculiar odors that may come from the run. A small sewer from the north runs along side of the building and empties into the run.

13*a* West William.

2. Geo. W. Henry (lives in rear of No. 13.
3 Three.
4–10. None.

15 West William.

2. Louise Trautman (saloon).
3. One.
4–10. Not in saloon at night.

17 West William.

2. D. A. Rodepouch (coal office).
3. Two.
4–10. None.

19 West William.

2. Carpenter and Truxall (livery stable).
3. Five.
4–10. None.

25 West William.

2. A. H. Demarest.
3. Eight.
4–10. Moved here in September—no sickness.

27 West William.

2. H. F. Brown.
3. Three.
4–10. None.

39 West William.

2. Dr. J. H. White.
3. Four.
4–8. None.
9. The odors so bad that they could not sit on their side porch any evening this summer.
10. None.

THIRD DISTRICT.

47 West William.
2. Mrs. Sarah M. Davis.
3. Three.
4–6. One case of rheumatism.
9. An unpleasant odor from run or from pig-pens.
10. None.

55 West William.
2. J. W. Wharton.
3. Nine.
4–6. Two cases of diphtheria.
8. No.
9. Yes, very bad in hot weather.
10. None.

61 West William.
2. Dr. E. M. Hall.
3. Six.
4–10. None.

67 West William.
2. Dr. C. Welch.
3. Fourteen.
4–9. None.
10. Yes.

75 West William.
2. J. Rosenthal.
3. Four.
4–10. None.

81 West William.
2. A. J. Bishop.
3. Four.
4–6. One child has had malaria *twice*.
8. Perhaps not due to the run.
9. Bad smells due to pig-pens.
10. No.

89 West William.
2. Mrs. Byers Adair.
3. Nine.
4–6. Two cases of grippe and malaria.
9. Run never affect them; think people are excited.

93 West William.
2. Mrs. Bland.
3. Eight.
4–10. None.

99 West William.
2. Mrs. Hutchinson.
3. Nine.
4–10. None.

105 West William.
2. C. M. Wells.
3. S x.
4–6. One case of la grippe.
9. Yes.
10. No.

107 West William.
2. Peter C. Long.
3. Four.
4–6. Two cases of la grippe.
8. Yes, I think the run aggravated the disease.
9. Many times, especially when the run is low.
10. No.

121 West William.
2 M. S. Wolf.
3. Four
4–6. Two cases of rheumatism.
8. I think it was caused partly by the run.
9. No.
10. Yes, the pipe from the sink (water-works).

125 West William.
2. O. L. Griswold.
3 Four.
4–8 Just moved in September.
9. Often notice an unpleasant odor.
10. No.

FOURTH DISTRICT.

190 West William.
2. W. W. Vansickle.
3. Four
4–6. One invalid—chronic disease of long standing.
9. The water at times has been very unpleasant.
10. None.

206 West William.

2. Mr. E. Davis.

3. Fifteen.

4–6. Some slightly ill with colds and indisposition at times.

8. Can not be positive, but believe that the stream contains germs of disease.

9. Very, very bad odors—almost intolerable at times—caused by decaying fish killed by the filth drained from improper sewerage across the street above.

10. Positively nothing whatsoever.

210 West William.

2. J. W. Leas.

3. Five.

4–8. No.

9 The unpleasant odors from the run caused us much anxiety during the summer.

10. No.

214 West William.

2. Mrs. L. T. Clark.

3. Four.

4–8. Attribute good health to quinine, disinfectants, etc., and no thanks to the Health Officers.

9 Have noticed very unpleasant odors from run during the summer. The condition of the run is a disgrace to the Health Officers of the city of Delaware.

10. No.

226 West William.

2 Mrs. M. S. Morgan.

3. Three.

4–6. One bilious attack or malaria.

8. Think that the illness has been caused or aggravated by the filth of the run.

9. Extremely unpleasant odors from the stream, causing much real inconvenience and anxiety.

10. None whatever.

232 West William.

2. Fred. Willis.

3. Four.

4–6. One case of "general illness."

8 Yes.

9. Very unpleasant odor from the run.

10. No.

230 West William.
2. F. M. Loader.
3. Seven.
4–6. Slight illness—nothing special.
8–10. No.

250 West William.
2. Rev. J. M. Peters.
3. Seven.
4–8. No.
9. Very unpleasant odor from the run.
10. No connection with run at all.

4 Quarry (north).
2. Patrick Teirney.
3. Six.
4–10. None.

— Quarry (north).
2. John Bults.
3. Three.
4–10. None.

Monnett Hall, College building.
2. C. B. Austin, Professor in charge.
3. Two hundred and twenty-five.
4–6. No cases of sickness in the building. Infected case of typhoid fever fifteen months ago—only case in ten years. Scarlet fever epidemic two years ago.
8. None.
9–10. See special report.

FIFTH DISTRICT.

14 Spring
2. Mrs. E. Brown.
3 Five.
4–8. No.
9. I have not from the run, but from the nuisances along the run.
10. No.

25 Spring.
2. E. M. Heller.
3. Five.
4–6. Three cases of malaria.
8. Yes, the doctors say so.
9. The odor is so bad that we can not open the windows—the closets are so bad.
10. No.

34 Spring.
2. Wm. Cook.
3. Five.
4–8. No.
9. Yes, some time ago when it was warm it was very disagreeable.
10. No.

34 Spring
2. Mrs. M. J. Anthony.
3. Three.
4–10. None.

36 Spring.
2. H. C. Strohm.
3. Five.
4–10. No, though I have lately moved here.

40 Spring.
2. J. V. Nash.
3. Eight.
4–8. None.
9. Yes, from the run or along the run.
10. No, except dish water.

50 Spring.
2. W. H. Thomas.
3. Three.
4–6. One case of hemorrhage of the kidney.
9. Yes, from some place.
10. No.

52 Spring.
2. Mrs. H. M. Crawford.
3. Six.
4–8. No
9. Yes, plenty of them along the run.
10. Yes, dish water, etc.

58 Spring.
2. C. F. Renner.
3. Five.
4–6. Three cases of la grippe.
8. I do not know.
9. Yes, in different weather according to the wind.
10. No. I had a hog-pen at the lower end of the yard but have removed it.

62 Spring.
2. H. Thomas.
3. Six.
4–10. None.

68 Spring.
2. J. W. Watson.
3. Five.
4–9. No.
10. Yes, dish water, etc.

72 Spring.
2. Michael Crause.
3. Four.
4–10. No.

78 Spring.
2. W. H. Smith.
3. Five.
4–6. One case of scarlet fever.
8. No.
9. Yes, from the run.
10. No.

104 Spring.
2. E. M. Crawford.
3. Ten.
4–8. No.
9. Not from the run but along the run. Keeps two cows, calf, horse and pigs behind one house.
10. Only a cellar drain.

108 Spring.
2. George Vining.
3. Three.
4–8. No.
9. Yes, we have some.
10. No.

112 Spring.
2. H. Miller.
3. Three.
4–10. None.

114 Spring.
2. J. F. Hawk.
3. Four.
4–6. One case of typhoid fever.
8. I do not think so.
9–10. No.

SIXTH DISTRICT.

96 South Henry.

2. Mrs. Julia Axton.
3. Nine.
4–10. No.

38 South Henry.

2. A. C. Ingham. (This house is within twenty feet of the run.)
3. Ten.
4–6. One case of consumption.
7. Died in the spring.
8. Do not think the case was aggravated by the run.
9. Yes, sometimes we could hardly stand it. We had to keep the house shut up towards night. Since the rain we do not shut up the house. My family come here from Columbus when they are sick to get well.
10. Yes, the run is all the drainage we have.

34 South Henry.

2. Perry Cochran.
3. Two.
4–6. One slight attack of malaria.
9. The odor was offensive this summer; not since the rains.
10. No.

30 South Henry.

2. C. V. Owston.
3. Two.
4–6. Neither of us have good health. Our trouble is malaria, fever, chills—almost every thing.
8. I think our trouble aggravated by the run. Is is a bad locality. We were affected before we came here; don't know that it is any different from what it was before we came.
9. Indeed we have had to go inside and shut our door when we would have otherwise sat outside.
10. No.

31 South Henry.

2. A. A. Veer.
3. Three.
4–6. Three cases of the grippe.
8. I don't know. It was early in the spring when the water was high that we were sick.
9. Yes, indeed; for two or three weeks it was quite offensive.
10. None.

25 South Henry.

2. Mrs. P. E. Hill.
3. One.

4–8. No.
9. No; though the run comes nearly to the corner of my fence.
10. Yes, dish-water.

17 South Henry—
2. J. C. Crickard.
3. Five.
4–8. No, unless you count a case of croup.
9. Yes, some times there is.
10. No.

21 South Henry.
2. G. H. Stewart.
3. Six.
4–8. No.
9. Oh, there has been at times.
10. No.

9 South Henry.
2. Nathan Siegfried.
3. Two.
4–10. No.

SEVENTH DISTRICT.

14 South Union.
2. J. H. Driver.
3. Eight.
4–8. No.
9. Yes, nearly every night—very bad odors.
10. No.

18 South Union.
2. L. Holzmiller.
3. Two.
4–6. One case of malaria.
8. Yes.
9. Yes; so bad I could hardly stand it all summer.
10. No.

22 South Union.
2. H. F. Owen.
3. Seven.
4–8. No.
9. Yes, extremely bad; seems like a poisonous smell; never noticed it so bad as the last summer.
10. Water from water pipe—no dish-water or any thing of that sort.

24 South Union.
2. John Gardner.
3. Eleven.
4–6. One case of typhoid-pneumonia.
7. John T. Evans, City Clerk.
8. No.
9. Yes.
10. Water from hydrant.

26 South Union.
2. Mrs. A. Weiser.
3. Ten.
4–8. No.
9. Beyond description.
10. No. I live on the run.

11 South Union.
2. James Cuchard.
3. Three.
4–8. No.
9. Yes.
10. Yes, waste-water pipe.

15 South Union.
2. Prof. G. W. Michael.
3. Six.
4–8. No.
9. Yes.
10. No.

23 South Union.
2. Mrs. Dempsy.
3. Nine.
4–8. No.
9. Very disagreeable.
10. Yes, sewer connection.

1 Michael Place.
2. F. Collier.
3. Seven.
4–6. Three cases of malaria.
8. I think so.
9. Yes, extremely bad.
10. Yes, sewer connection.

2 Michael Place.
2. Mrs. Black.
3. Two.
4–6. One case of malaria.

8. Yes, I think so.
9. Yes.
10. Yes, the "Row sewer" into which all the waste water escapes.

4 Michael Place.
2. G. H. Knopple.
3. Six.
4–6. Sore throat and bad cold—three cases.
8. Yes.
9. Yes, it is very offensive.
10. Yes, the "Row sewer," all waste water from the house.

5 Michael Place.
2. S. G. Hurst.
3. Two.
4–6. One case of malaria.
8. Yes.
9. Yes, I should think so. It is very unpleasant all the time.
10. Yes, the "Row sewer."

EIGHTH DISTRICT.

16 South Franklin.
2 David Inscho.
3. Three.
4–8. One case of old age.
9. Yes, indeed.

52 South Franklin.
2. Jacob Young.
3. Four.
4–6. One case of malaria.
8. I am not sure.
9. Yes.
10. No.

19 South Franklin.
2. W. Z. Evans.
3. Four.
4–8. No.
9. Not from the run, but from pig-pens and stables.
10. No.

25 South Franklin.
2. Mrs. Graham.
3. Four.
4–6. One case of typhoid fever.
8. Can't tell.
9. Yes, very unpleasant—mostly from pig-pens.
10. No.

27 South Franklin.
2. Mrs. Seegar.
3. Three.
4–10. None. Pig-pens and stables are very offensive.

43 South Franklin.
2. D. B. Jones.
3. Seven.
4–10. No, except as to ———'s pig-pens.

45 South Franklin.
2. D. S. Truxall.
3. Four.
4–8. None.
9. Yes, indeed, mostly from stables and pig-pens.
10. No.

NINTH DISTRICT.

36 South Washington.
2. George W. Perry.
3. Three.
4–10. None.

46 South Washington.
2. Mr. John Cunningham.
3. Three.
4–6. One case of old age and paralysis.
7. John Cunningham died on September 30, 1891.
8. No. We never once thought of such a thing. We have lived here for more than twenty years and have had almost perfect health.
9–10. No.

37 South Washington.
2. J. Barkelo.
3. Four.
4–10. None.

13 North Liberty.
2. Mrs. F. M. Joyner.
3. Five.
4–6. Two cases of inflammation of the bowels.
8–10. No.

7 North Liberty.
2. Mrs. Lena Keifer.
3. Seven.
4–10. None.

3 North Liberty.
2. M. Sidney.
3 Five.
4–9. None.
10. Yes.

8 South Liberty.
2. E. H. Curtis.
3. Eight.
4–8. No.
9. Yes; from drainage of water-closets.

9 South Liberty.
2. O. E. Taylor.
3. Two.
4–8. No.
9. Yes, from the trash thrown in.
10. No.

10 South Liberty.
2. Phœbe Jones.
3. Six.
4–8. No.
9. Yes. Neglect of people.
10. None.

16 South Liberty.
2. Mrs. Holmes.
3. Four.
4–10. No.

19 South Liberty.
2. Mrs. Lindsey.
3. Five.
4–6. One case of malaria.
8–10. No.

13 South Liberty.
2. Oscar Gregory.
3. Eight.
4–8. No.
9. Yes, water black at times.
10. None.

TENTH DISTRICT.

14 Elizabeth.
2. James Nichols.
3. Five.

4–8. No.
9. Yes, we were troubled a good deal during the summer.
10. No.

20 Elizabeth.
2. S. E. Ervin.
3. Four.
4–8. No.
9. Yes.
10. No.

12 Catherine.
2. Mrs. B. Davis.
3. Four.
4–10. None. Some smell at times.

16 Catherine.
2. Mrs. Simons.
3. Five.
4–6. Two cases of the grippe.
8. I think it was. We were taken soon after moving into this house.
9. Yes, during warm weather.
10. No.

TABLE SHOWING THE DISTRIBUTION OF SICKNESS AND DEATH BY STREETS.

East William Street.

Street No.	Number in family.	Sickness.	Deaths.	Disease.
122	4	1	.....	Rheumatism.
118	3	.....	.....	
116	9	2	.....	Malaria or typhoid.
110	9	.....	.....	
104	6	1	.....	Heart disease.
100	5	2	.....	Diabetes and typhoid fever.
96	6	1	.....	Chronic diarrhœa.
94	5	.....	.....	
80	2	.....	.....	
72	4	1	.....	Diabetes and old age.
58	12	2	.....	Combination.
52	5	.....	.....	
46	14	.....	.....	
40	12	.....	.....	
28	6	.....	.....	
26	2	.....	.....	
20	4	1	.....	Heart failure and lung trouble.

West William Street.

13	5	.....	.....	
15	1	.....	.....	
17	2	.....	.....	
19	5	.....	.....	
25	8	.....	.....	
27	3	.....	.....	
39	4	.....	.....	
47	3	1	.....	Rheumatism.
55	9	2	.....	Diphtheria.
61	6	.....	.....	
67	14	.....	.....	
75	4	.....	.....	
81	4	2	.....	Malaria—same patient.
89	9	2	.....	Grippe.
93	8	.....	.....	
99	9	.....	.....	
105	6	1	.....	Grippe.
107	4	2	.....	Grippe.
113	9	1	.....	Malaria and lung trouble.
121	4	2	.....	Rheumatism.
125	4	.....	.....	
190	3	1	.....	Chronic invalid.
206	15	.....	.....	
210	5	.....	.....	
214	4	.....	.....	
226	3	1	.....	Malaria.
232	4	1	.....	General illness.
230	7	.....	.....	
250	7	.....	.....	
	277	27	.....	

TABLE SHOWING THE DISTRIBUTION OF SICKNESS AND DEATH BY STREETS—Continued.

QUARRY STREET.

Street No.	Number in family.	Sickness.	Deaths.	Disease.
....	6	.....	.....	
.....	3	.....	.....	
	9	.....	.....	

MONETT HALL.

.....	225	.....	.....	
	225	.....	.....	

SPRING STREET.

14	5	.....	.....	
26	5	3	.....	Malaria.
34	5	.....	.....	
34	3	.....	.....	
36	5	.....	.....	
40	8	.....	.....	
50	3	1	.....	Hemorrhage of the kidney.
52	6	.....	.....	
58	5	3	.....	Grippe.
62	6	.....	.....	
68	5	.....	.....	
72	4	.....	.....	
78	5	1	.....	Scarlet fever.
104	10	.....	.....	
108	3	.....	.....	
112	3	.....	.....	
114	4	1	.....	Typhoid fever.
	85	9	.....	

SOUTH HENRY STREET.

96	3	.....	.....	
38	10	1	1	Consumption—death.
34	2	1	.....	Slight malaria.
30	2	2	.....	Malaria.
31	3	3	.....	Grippe.
25	1	.....	.....	
21	6	.....	.....	
17	5	1	.....	Croup.
9	2	.....	.....	
	34	8	1	

TABLE SHOWING THE DISTRIBUTION OF SICKNESS AND DEATH BY STREETS—Continued.

UNION STREET.

Street No.	Number in family.	Sickness.	Deaths.	Disease.
14	8	.....	.....	
18	2	1	.....	Malaria.
22	7	.....	.....	
24	11	1	1	John T. Evans, typho-pneumonia.
26	10	.....	.....	
11	3	.....	.....	
15	6	.....	.....	
23	9	.....	.....	

MICHAEL PLACE.

1	7	3	.....	Malaria.
2	2	1	.....	Malaria.
4	6	3	.....	Bad colds.
5	2	1	.....	Malaria.
	73	10	1	

SOUTH FRANKLIN STREET.

16	3	1	.....	Old age.
52	4	1	.....	Malaria.
19	4	.....	.....	
25	4	1	.....	Typhoid.
27	3	.....	.....	
43	7	.....	.....	
45	4	.....	.....	
	29	3		

WASHINGTON STREET.

36	3	.....	.....	
46	3	1	1	John Cunningham, old age.
37	4	.....	.....	

NORTH LIBERTY STREET.

13	5	2	.....	Inflammation of bowels.
7	7	.....	.....	
3	5	.....	.....	

SOUTH LIBERTY STREET.

8	8	.....	.....	
11	.....	.....	.....	
9	2	.....	.....	
10	6	.....	.....	
16	4	.....	.....	
19	5	1	.....	Malaria.
13	8	.....	.....	
	60	4	1	

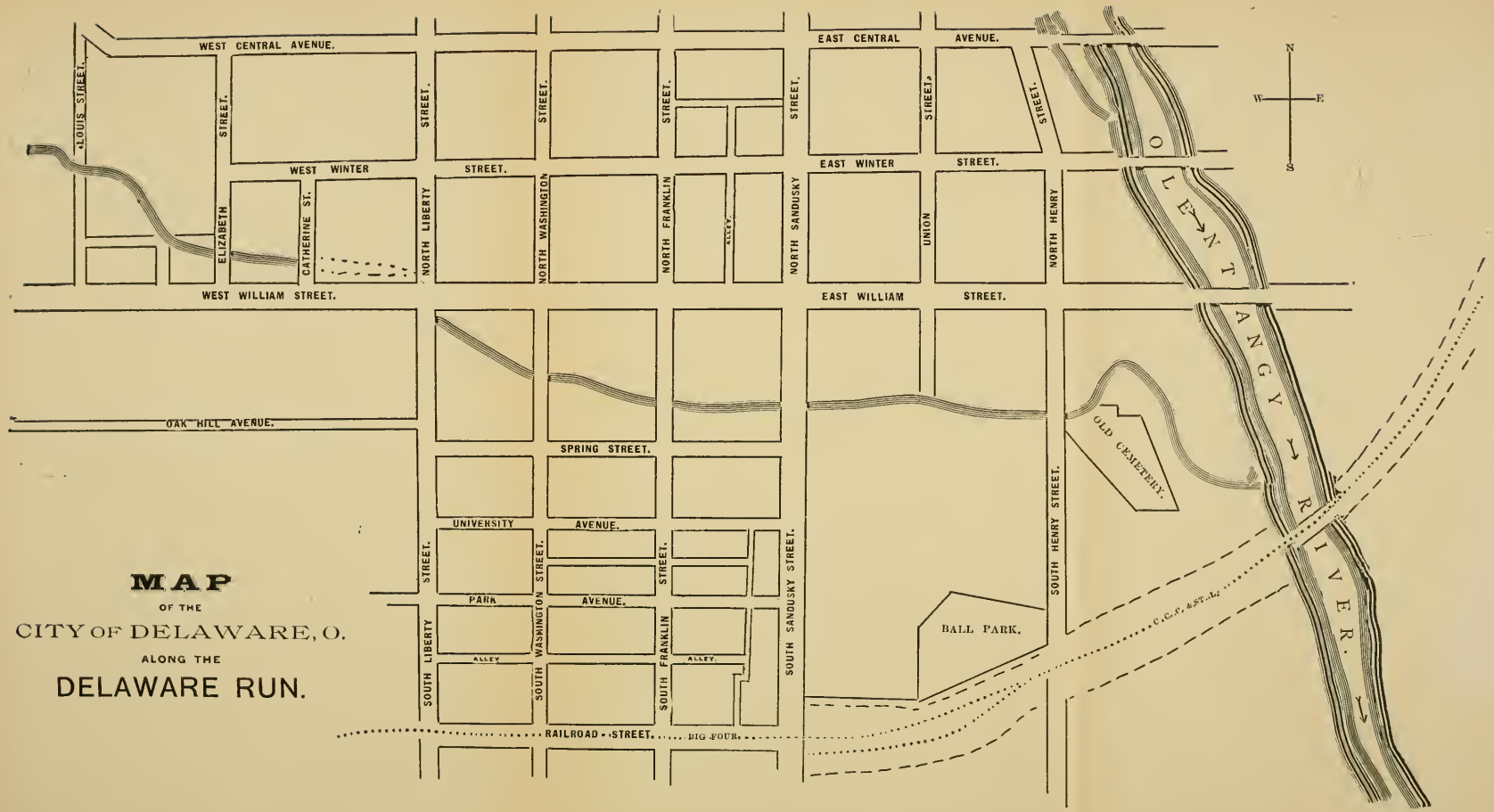
TABLE SHOWING THE DISTRIBUTION OF SICKNESS AND DEATH BY STREETS—Concluded.

ELIZABETH STREET.

Street No.	Number in family.	Sickness.	Deaths.	Disease.
14	5	.....	.....	
20	4	.....	.....	

CATHERINE STREET.

12	4	.....	.....	
16	5	2	.....	Grippe.
	18	2	.....	


MAP
OF THE
CITY OF DELAWARE, O.
ALONG THE
DELAWARE RUN.
WEST CENTRAL AVENUE.
EAST CENTRAL AVENUE.
LOUIS STREET.
STREET.
WEST WINTER STREET.
EAST WINTER STREET.
ELIZABETH
CATHERINE ST.
NORTH LIBERTY
NORTH WASHINGTON
NORTH FRANKLIN
ALLEY.
NORTH SANDUSKY
UNION
NORTH HENRY
WEST WILLIAM STREET.
EAST WILLIAM STREET.
OAK HILL AVENUE.
SPRING STREET.
UNIVERSITY AVENUE.
PARK AVENUE.
SOUTH LIBERTY
SOUTH WASHINGTON
SOUTH FRANKLIN
SOUTH SANDUSKY STREET.
SOUTH HENRY STREET.
OLD CEMETERY.
BALL PARK.
RAILROAD STREET.
BIG FOUR.
C.C.C. & ST. L.
OLENTANGY RIVER.
N
W
E
S

LIST OF LOCAL BOARDS OF HEALTH AND HEALTH OFFICERS.

Aberdeen	J. W. Guthrie, M. D.
Ada	W. H. Morrow.
Addison	
Akron	A. A. Kohler, M. D.
Alliance	P. W. Welker, M. D.
Amelia	W. B. Doan, M. D.
Ansonia	H. A. Snorf, M. D.
Antwerp	J. H. Baund.
Arcanum	D. I. Robbins.
Archbald	Henry Dimke.
Ashland	B. Myers, M. D.
Ashley	S. R. Harris.
Ashtabula	A. W. Hopkins, M. D.
Ashville	J. W. Johnson.
Athens	W. N. Alderman, M. D.
Attica	A. W. Knight, M. D.
Avondale, Hamilton Co	Jos. A. Brown.
Bainbridge	L. F. House, M. D.
Baltimore	B. K. Thomen, M. D.
Barnhill	R. A. Douglas, M. D.
Barnesville	W. W. Hanlon.
Batavia	
Beallsville	Jno. W. Reed, M. D.
Bedford	L. J. Gordon.
Bellaire	J. Park West, M. D.
Belle Center	W. S. Phillips, M. D.
Bellefontaine	C. W. Heffner, M. D., Sec'y.
Belleville	T. T. Austin, M. D.
Bellevue	John Earls.
Berea	T. G. Card, Sec'y.
Berlin Heights	
Bethel	W. W. Smith, M. D.
Bettsville	H. M. Buckingham, M. D.
Beverly	F. A. Pomeroy.
Blanchester	S. B. Judkins, M. D.
Bloomdale	G. H. Riley, M. D.
Bloomingburg	J. J. Pinkerton.
Bloomville	J. W. Hoy, M. D.
Bluffton	F. J. Baldwin, M. D.
Bolivar	
Bond Hill	G. Perin.
Bowling Green	A. Ordway.
Bowerston	E. E. McPeck, M. D.

Bridgeport	Jno. W. Stuff.
Brookfield	
Brooklyn	R. E. Stickney.
Brookville	A. C. Berst.
Bryan	S. T. Martin.
Bucyrus	C. H. Noblet, M. D.
Byesville	M. W. Peters.
Cadiz	M. J. Lyons, M. D.
Caledonia	Preston Smith.
Caldwell	O. O. McKee, M. D.
Cambridge	M. D. Star, M. D.
Camden	C. C. Jones, M. D.
Canal Dover	T. H. Brannon, M. D.
Canal Fulton	Jos. Miller.
Canal Winchester	L. W. Beery, M. D.
Canfield	A. D. Woods.
Canton	S. B. Post, M. D.
Cardington	R. T. Mills.
Carey	J. D. Southward, M. D.
Carroll	
Carrollton	
Carthage	Harry Ross.
Cedarville	Gregory Weymouth.
Celina	L. P. Lisle, M. D.
Centerburg	R. C. M. Lewis.
Chagrin Falls	J. H. Isaacs, clerk.
Chardon	
Chester Hill	W. M. Barnes, M. D.
Chicago	D. H. Young, M. D.
Chillicothe	A. P. Cole, M. D.
Cincinnati	J. W. Prendergast, M. D.
Circleville	S. B. Evans.
Clarington	Jno. E. Morrell.
Cleveland	Jamin Strong, M. D.
Cleves	W. C. Hughes, M. D.
Clifton	W. H. Bell, M. D.
Clyde	Alex. Harnden.
Coalton	
College Hill	
Collinwood	A. L. Waltz, M. D.
Columbiana	Geo. Roninger.
Columbus	Lee McBriar, M. D.
Columbus Grove	W. H. Begg, M. D.
Conneaut	E. D. Merriam, M. D.
Continental	S. N. Aller, M. D.
Convoy	
Corning	G. W. DeLong, M. D.
Cortland	
Coshocton	Isaac Hagans.
Covington	S. C. Sisson.
Crestline	C. E. Trimble, M. D., act'g.
Cridersville	Jas. P. Church.
Cumberland	
Cuyahoga Falls	I. N. Reid.
Cygnet	A. A. Mercer, M. D.

Dalton	J. M. Fiscus.
Dayton	A. H. Iddings, M. D.
Defiance	A. Berchtold, M. D.
DeGraff	W. H. Hinkle, M. D.
Delaware	J. W. N. Vogt, M. D.
Delhi	M. L. Andrews.
Delta	S. P. Bishop, M. D.
Delphos	J. M. March, M. D.
Dennison	S. L. McCurdy, M. D.
Deshler	
Doyleston	A. E. Stepfield, M. D.
Dresden	
Dunkirk	C. C. McLaughlin, M. D.
Dupont	Henry Crowe.
East Fairfield	G H. Albright, M. D.
East Liverpool	Wm. Gibbs.
East Palestine	E. H. Smith.
Eaton	O. H. Jefferson.
Elyria	W. F. McLean, M. D.
Edgerton	W. E. Rathburn.
Edon	R. A. Chisholm.
Elmore	R. A. Willett, M. D.
Elmwood Place	F. C. Broeman.
Fairfield	N. D. Guthridge.
Fairport	D. A. Lewis.
Fayette	E. J. Emerick.
Felicity	C. E. Houghton.
Findlay	B. A. Banker.
Flushing	J. V. Webster, M. D.
Forest	W. N. Mundy, M. D.
Fostoria	J. O. Hess.
Frankfort	
Franklin	D. A. Williams, M. D.
Frazeysburg	D. V. Randall.
Fredericktown	John T. Cornell.
Freeport	R. J. Pumphrey.
Fremont	Wm. Caldwell.
Galion	C. F. Eise.
Gallipolis	D. A. Howell, M. D.
Gambier	E. J. Hyatt, M. D.
Garrettsville	L. L. Johnson, M. D.
Fredericksburg	L. C. Miller.
Geneva	F. E. Tibbitts.
Genoa	J. L. Trutton, M. D.
Georgetown	A. M. Kantz.
Germantown	Wm. Schaeffer.
Gibsonburg	W. M. Brown.
Girard	Jno. McCartney.
Glendale	Thos. J. Biggs, Jr., M. D.
Glenville	Jas. B. Cook.
Grafton	Jno. Isley.
Glouster	A. W. Collison, M. D.
Granville	Jno. Watkin, M. D.
Greenfield	Geo. Rucker, Secretary.
Green Springs	D. P. Campbell, M. D.

Greenville	A. F. Markwith, M. D.
Greenwich	R. B. Reynolds. M. D.
Groveport	C. R. Clement, M. D.
Hamilton	C. N. Huston, M. D.
Hamler	Wm. Barhite.
Hanging Rock	.....
Harmar	Jno. W. Knox.
Harrisburg	.....
Harrison	Thos. Bowles, Secretary.
Hartwell	C. W. Tufts, M. D.
Hicksville	S. Blodget.
Higginsport	J. H. Williamson, M. D.
Hilliards	N. P. Davidson, M. D.
Hillsboro	H. M. Brown.
Holgate	Jno. Miller, M. D.
Home City	L. B. Terrill, M. D.
Hudson	L. D. Osborne, M. D.
Huntsville	F. A. Richardson, M. D.
Huron	J. H. Calvin, M. D.
Ironton	N. K. Moxley, Jr., M. D.
Jackson	J. J. Williams.
Jacksonville	W. W. Wolfe, M. D.
Jamestown	F. W. Ogan, M. D.
Jeffersonville	G. M. Ireland, M. D.
Jewett	James Denny.
Kalida	S. Melvin.
Kent	J. F. Clark.
Kenton	J. W. Binkley, M. D.
Kingston	C. B. James, M. D.
La Grange	G. N. Snyder.
Lancaster	J. W. Lewis, M. D.
La Rue	M. V. Toner.
Latty	.....
Lebanon	F. H. Frost, M. D.
Leesburg	H. A. Beeson, M. D.
Leetonia	S. R. McCready, M. D.
Leipsic	Jno. McClung, M. D.
Liberty Center	.....
Lima	L. J. Steuber, M. D.
Linwood	W. S. Reynolds.
Lockland	R. B. Latta.
Logan	I. C. Wright, M. D.
London	C. E. Gain, M. D.
Lorain	S. S. Cox, M. D.
Louisville	F. E. Favret.
Loveland	J. B. Scott, M. D.
Lowellville	W. S. Baker.
Ludlow Grove	R. H. Whallon.
Lynchburg	Andrew Bishir.
Macksburg	.....
Madison	A. H. Stockham, M. D.
Madisonville	E. A. Flinn, M. D.
Malta	Norman McAskill.
Malvern	E. C. Ross, M. D.
Manchester	J. W. Guthrie, M. D.

Mansfield	R. Harvey Reed, M. D.
Marietta	C. W. Eddy, M. D.
Marion	E. Marterson.
Marseilles	
Marshallville	G. D. McIntire.
Mantua Station	
Martin's Ferry	R. A. Lindemuth.
Marysville	J. H Shirk.
Mason	J. M. Van Dyke, M. D.
Massillon	T. Clark Miller, M. D.
Maumee City	G. W. Rhonehouse, M. D.
McArthur	
McComb	J. A. Thompson, M. D.
McConnelsville	J. D. Maris.
Mechanicsburg	O. A. Nincehelser, M. D.
Mechanicstown	J. M. Watt, M. D.
Medina	E. E. Standen.
Melrose	R. E. Kingery.
Mentor	J. W. Lowe, M. D.
Miamisburg	W. S. Bookwalter, M. D.
Middleport	J. H. Pake, M. D.
Middletown	G. D. Lummis, M. D.
Milan	Richard Rawl.
Milford	F. C. Curry, M. D.
Milford Center	W. H. Wills, M. D.
Millburg	
Millersburg	J. E. Whitmar, M. D.
Mineral Ridge	A. M. Beach, M. D.
Minersville	
Minerva	Thos. J. Rouch.
Mingo Junction	Jas. Brettell.
Minster	A. N. Rullman, M. D.
Monroeville	J. T. Gill, M. D.
Montgomery	
Montpelier	
Moscow	J. R. Wiley.
Morrow	J. W. Shockey, M. D.
Mt. Blanchard	J. Odenbaugh. M. D.
Mt. Gilead	A. E. Young.
Mt. Healthy	
Mt. Orab	J. A. Cumberland.
Mt. Pleasant	J. A. McGlenn, M. D.
Mt. Sterling	E. F. Collins.
Mt. Vernon	B. B. Scott, M. D.
Mt. Victory	L. T. Mahon, M. D.
Murray City	
Napoleon	
Nashport	H. L Curtis.
Navarre	A. W. Gosham.
Nelsonville	Chas. W. Coble, M. D.
Nevada	G. F. Cole, M. D.
Newark	W. C. Rank, M. D.
New Bremen	M. S. Eckermyer, M. D.
New Carlisle	Ben. Davis, M. D.
Newcomerstown	R. A. Goudy, M. D.

New Concord	
New Holland	B. F. Sanguary.
New Lexington	J. H. Wright, M. D.
New Lisbon	R. G. Eells.
New London	W. B. Newkirk.
New Matamoras	W. L. West, M. D.
New Madison	E. A. Hecker, M. D.
New Moorefield	
New Paris	I. S. Robinson, M. D.
New Philadelphia	B. V. Scott, Sec'y.
New Richmond	T. J. Mullen, M. D.
New Straitsville	C. B. Powell.
Newton Falls	C. M. Rice, M. D.
New Vienna	R. T. Trimble, M. D.
New Washington	J. F. Kimerline.
Niles	F. Casper, M. D.
North Amherst	W. H. Cornwell, M. D.
North Baltimore	W. R. Martin.
North Lewisburg	Dan'l Brown.
Norwalk	M. Suydam.
Norwood	C. W. Tidball, M. D.
Oak Harbor	J. M. Stewart, M. D.
Oak Hill	D. B. Warren, M. D.
Oakley	
Oakwood	J. H. Stover.
Oberlin	E. L. Burger.
Ohio City	E. T. Runnion.
Olmsted	H. B. Horthroy.
Orrville	H. Blankenhorn, M. D.
Osborne	R. O. Hoover, M. D.
Ottawa	O. E. Beardsley, M. D.
Oxford	H. D. Hinkley, M. D.
Painesville	S. D. Barber.
Paint	
Pataskala	James Lisle, M. D.
Paulding	P. A. Dix, M. D.
Payne	C. V. Gorrell, M. D.
Pemberville	E. B. Morse.
Peninsula	W. N. Boerstler, M. D.
Peebles	Jas. W. Yankie.
Perrysburg	J. H. Rhinefrank, M. D.
Perrysville	Dr. S. N. Alban.
Pioneer	W. H. Durbin.
Piqua	F. E. Kitzmiller, M. D.
Plain City	M. J. Jenkins, M. D.
Pleasant Hill	S. W. Bausman, M. D.
Pleasant Ridge	J. J. Marvin, M. D.
Plymouth	R. D. Sykes, M. D.
Pomeroy	J. H. Hysell, M. D.
Prospect	C. M. C. Thomas, M. D.
Port Clinton	Thos. J. Marshall.
Portland	C. E. Hudgins, M. D.
Portsmouth	C. L. Hudgins, M. D.
Port Washington	

Proctorville	Amos Ripley.
Quaker City	Barnard Eagon.
Ravenna	Jos. Gledhill.
Rawson	Howard Stallsmith.
Reading	F. X. Ankenbauer.
Rendville	J. S. Sessions, M. D.
Richwood	H. C. Hamilton.
Ripley	J. P. Tyler, M. D.
Rockford	T. G. McDonald, M. D.
Riverside	F. Kuserick, M. D.
Rock Creek	J. C. Knowlton.
Roseville	W. A. Melick, M. D.
Rocky Ridge	A. Garris.
St. Clairsville	D. L. Walker, M. D.
St. Mary's	W. B. Schoonover, M. D.
St. Paris	C. A. Offenbacher, M. D.
Sabina	J. L. Johnson.
Salem	Paul Barckhoff, M. D.
Salineville	Jas. Carter.
Sandusky	Elwood Stanley, M. D.
Savannah	L. S. Cowie, M. D.
Scio	M. E. McAdoo, Clerk.
Sedalia	E. B. Mead, M. D.
Seville	P. E. Beach, M. D.
Scott	D. M. Berry.
Sewellsville	.....
Sharon	.....
Shawnee	H. E. White, M. D.
Shelby	D. O. Summers, M. D.
Sherodsville	W. H. Watkins.
Sherwood	E. J. Potter.
Shiloh	L. F. Henry, M. D.
Shreve	.....
Sidney	Edwin Le Fevre, M. D.
Smithfield	.....
Smithville	J. W. Bricker, M. D.
Somerford	.....
Somerset	R. B. Woodward, M. D.
South Charleston	M. H. Collins.
Spencerville	J. C. Pence, M. D.
Springfield	H. H. Seys, M. D.
Spring Valley	S. E. Dyke, M. D.
Springboro	David Mering.
Steubenville	A. A. Elliott, M. D.
Summerfield	F. R. Lodecker.
Sunbury	G. H. Gerhardt, M. D.
Sycamore	W. H. Wickham, M. D.
Sylvania	G. A. Crandall.
Taylorsville	.....
Tiffin	J. Bridinger, M. D.
Tippecanoe City	Edgar Franklin.
Toledo	A. W. Fisher, M. D.
Tontogany	A. Eddmon, M. D.
Toronto	.....

Troy	J. G. Senour, M. D.
Uhrichsville	J. E. Groves, M. D.
Union City	W. M. Grimes, M. D.
Upper Sandusky	O. C. Stutz, M. D.
Urbana	H. C. Houston, M. D.
Utica	H. C. Dicus, M. D.
Van Wert	E. W. Wilkinson, M. D.
Vermillion	A. Matteson.
Versailles	W. H. Rike, M. D.
Wadsworth	C. M. Lyman, M. D.
Wapakoneta	Jno. B. Mouch.
Warren	W. C. Hunt, M. D.
Washington C. H.	J. M. Edwards.
Waterville	Samuel Downs, M. D.
Wauseon	J. H. Waddell, M. D.
Waverly	G. D. Emmitt.
Waynesburg	
Waynesville	W. E. Oglesbee, M. D.
Wellington	J. J. Thomas.
Wellston	F. Z. Wells.
Wellsville	J. F. Davidson.
Westerville	J. W. Oyler.
West Alexandria	L. J. Ashworth.
West Jefferson	W. E. Postle, M. D.
West Cleveland	L. J. Smith, M. D.
West Leipsic	
West Liberty	B. S. Leonard, M. D.
West Milton	W. O. Furnas.
West Salem	D. W. Carver, M. D.
Weston	E. W. Schooley, M. D.
West Union	
West Unity	J. H. Fiddler.
Whitehouse	F. M. Heath, M. D.
Wilmington	G. M. Austin, M. D.
Williamsburg	F. M. Wardlow, M. D.
Williamsport	G. O. Hayes, M. D.
Willoughby	
Willshire	J. K. Ross, M. D.
Winchester	C. W. Salisbury, M. D.
Winton Place	E. O. McCullom, M. D.
Woodsfield	C. C. Hall, M. D.
Woodville	Henry Busch.
Woodstock	T. W. Owen.
Wooster	J. E. Barrett, M. D.
Worthington	S. W. Beall, M. D.
Wyoming	A. M. Van Dyke, M. D.
Xenia	L. H. Brundage, M. D.
Yellow Springs	W. M. Haffner, M. D.
York	
Youngstown	W. L. Buechner, M. D.
Zaleski	F. M. Smallwood, M. D.
Zanesville	H. T. Sutton, M. D.

APPENDIX I.

SHOULD PUPILS BE REQUIRED TO STUDY OUT OF SCHOOL?

Prof. L. W. Day, Superintendent of Public Schools, Cleveland, O.

[Read at a joint meeting of State Board of Health and Superintendents of Public Schools.]

To answer this question satisfactorily requires a careful consideration of certain fundamental principles and conditions that underlie educational and mental growth, and the application of these principles to the various grades and conditions of school life. The answer must of necessity be a comparative—a tentative one—depending upon circumstances; for the time out of school must be employed in some manner more or less beneficial to the pupil, either physically or mentally, or in both respects. Certainly his physical development needs great care and thoughtful attention. Without health there is little hope of satisfactory mental growth. It, however, does not follow that healthful bodily exercise and proper mental exertion may not go hand in hand, both in and out of school, resulting in symmetrical development. If the bodily growth requires care and attention, much more does the mental—the intellectual. For this reason it is quite essential that correct habits of study and thought be early formed and gradually established. To do this requires in a large measure the careful supervision of the competent teacher. The formation of these habits should never be left to chance. There is little opportunity and probably no necessity for home work or out-of-school study in the earlier years of development. As the pupil progresses in his work, as correct habits are formed, the conditions change somewhat, and certain out-of-school exercises may, with considerable profit and with no deleterious effects, be given. Such work, however, below the High School, should be limited in quantity and infrequent as to occurrence. It does not follow that because certain judicious exercises of this character are occasionally valuable, therefore such requirement should be laid upon all pupils with any degree of regularity; neither is it true that because certain conditions, either of physical health, immaturity of mind, or character of work, render out-of-school study improper and injurious, therefore all home study is to be condemned. Such a course would be extremely illogical. In a general way, then, it may be said that pupils from six to twelve or fourteen years of age should have little, if any, home work. But even this general statement, as it applies to pupils of a dozen or more years, needs qualification and restriction. Aside from the physical condition of the pupil, very much depends upon his habits and mental condition, as also upon the character of the work required. If "lessons" are postponed until the very last thing, and if, in addition to this, the home work required is simply the copying of some production which has been deemed unsatisfactory as to appearance; if rules, remarks, exceptions and explanatory notes are to be memorized: if compositions are to be re-written on account of some slight error of statement or arrangement; if a spelling lesson is to be copied a number of times on account of a word or two or three that have been missed, or if long and tedious analyses of sentences, the formal parsing of words, or any other such nonsense, is required, then the whole proceeding becomes distasteful, unprofitable—a positive injury—simply worrying and fretting the child and adding nothing to his mental grasp or acumen. No

wonder that, when such home work is required, the pupil prefers his story book—even his dime novel or his nickel edition of "Jack the Jumper." The one pleases and injures, the other displeases and injures. His displeasure soon extends so as to include his whole school work and surroundings—teacher, board of education and all. The benefit of home work depends on the spirit with which it is undertaken by the pupil. Unless the teacher has succeeded in inspiring a degree of enthusiasm that will impel the child to take up the work cheerfully and perform it with some mental spring, he should not require the work. Neither should it ever be required at the expense of physical health.

So much for pupils below the High School. In the High School the question presents a somewhat different phase. The pupils are older; are more mature, both physically and mentally; have had eight years of experience and practice in the lower grades, and should be able now to do much more independent, individual work. It is for this purpose that they enter the High School. It is not to be expected that in this department of the public school teachers will be required to supervise the studying of pupils, but rather that they shall devote their energies to the careful and fearless inspection of the results of such independent preparation, and if need be, to determine whether, in fact, the preparation has been thoughtful, independent and thorough—to use the mental probe freely to discover whether the pupil comprehends his work or simply remembers it. The burden of preparation lies wholly with the pupil and not with the teacher, nor yet with the school. True, the teacher must give the necessary assistance, but other classes and other pupils need attention. The pupil must therefore be self-reliant. If this be true, he must become such either in the school room, out of it, or under a combination of the two. The school room, with its varying surroundings, is not the best possible place for such accomplishment. It is very valuable on account of the difficulties surrounding it, providing the difficulties are successfully met and overcome. The privacy of the home affords the best possible opportunity for uninterrupted work—for individual thought, for thorough, intelligent preparation, for personal application. Moreover, the results of his unaided preparation are to be tried in the crucible of class recitation. His errors, omissions, misconceptions and shortcomings are quite sure of detection. His interpretation of the subject matter under consideration is to be brought into comparison or contrast with the interpretation of others made under similar circumstances. Not all, but very much of his work must be thus prepared.

Is it urged that this involves unnecessary labor, an undue amount of mental effor on the part of the pupil? Courses of study both for High Schools and for the lower grades are arranged for the pupil of average ability, or rather below this, the course being simply the minimum of requirement. The successful teacher will be able to so conduct his work as to benefit this mediocre class and at the same time interest and instruct those of greater ability, both natural and acquired. (It is very largely a matter of individual effort on the part of the pupil.)

Several years ago the charge of over-work in the High and Grammar Schools of Cleveland was very carefully and systematically investigated by the superintendent and appropriate committees. It was very clearly shown that nearly all the deleterious effects of out-of-school study were due to an excessive amount of light reading, party going, etc. In the High School the demands of "society" played an essential part. The amount of miscellaneous reading reported was something astonishing, requiring an outlay of several hours daily. Further inquiries developed the additional facts (*a*) that this miscellaneous reading almost uniformly preceded the preparation of lessons, throwing the latter far into the night, and (*b*) that those who did the greatest amount of light reading spent the most time on their studies, due doubtless to the fact that the brain was weary and the eyes heavy before the legitimate school work was commenced. And yet it was the fashion in those days—not now, thank the Lord!—to charge all the bad effects of late hours, whether the result of the light reading, theater-going, society parties, or what not, to the demands of the school. The revelations were astonishing, and determined

efforts, which proved somewhat successful, were immediately made to correct the evils discovered.

The same inquiry showed that, under these adverse circumstances, from one to three, and in some instances four, hours were spent out of school in the preparation of lessons. From one to two hours are probably necessary. The average with us is probably about 100 minutes per day.

(If, in order to secure normal bodily health and development, suitable physical exercises are necessary, it is equally true that, to secure normal mental development, exercises suitable to this end must be required. If a symmetrical growth of body and mind is desirable, then these developments should go hand in hand, each supplementing and restricting the other, as occasion may demand.)

There is, in my judgment, too much of a tendency in some quarters to demand that the school be so conducted and managed as that pupils shall be carried along in a successful prosecution of their studies without much effort on their part. Such a proceeding is utterly impossible. There are improved methods, to be sure—much that is useless has been eliminated; but there is no royal road to learning. The school room is a workshop and the pupil is a laborer, and there is something for him to do. He must let go the hand of the teacher; he must become self-reliant. This is a matter of growth. It is therefore essential that away from the inspiration of the school, as well as in it, away from the encouraging smile of his teacher, as well as under it, alone with nothing to inspire him but his own will and ability, he shall master many of the questions to be settled next day in the arena of the class-room. Where is the objection to this, if his physical health is at least fair? Is he to whimper and receive help when difficulties present themselves? No. Such a course is not only belittling to the pupil, but it is thoroughly unphilosophical—it is mistaken kindness.

I have attempted in the foregoing to say—

1. That in the earlier Primary and Grammar grades there is no call for any amount of home work. That it would be injudicious to require such work.

2. That in the grades next preceding the High School judicious out-of-school study may, to a very limited extent and under certain restrictions, be required, to the end that self-reliance, even at this age, may be inspired.

3. That in High School work there is not only no objection to such out-of-school study, but that within reasonable limits it is essential to the very best interests of the pupils concerned.

4. That from first to last the physical health and development of the body should be carefully considered, and when the requirements of study, either in school or out, seriously interfere, these requirements shall give way, but not until the requirements of "society" and cheap literature have been revoked.

SHOULD SCHOOL EXAMINATIONS BE ABANDONED?

Dr. J. F. Baldwin, Columbus, O.

[Read at a joint meeting of the State Board of Health and Superintendents of Public Schools.]

For nearly sixteen years I have been engaged in the practice of medicine in this city.

During the entire period, I have had my attention called, with each recurring trimester, to the matter of our school examinations. I have not been a member of the School Board, nor have I, save on one occasion, ever attended an examination. But the

constantly iterated appeal of the children to whose illnesses I have been called to minister, has been: "Doctor, can't you get me well in time for examination next week?" Or, "It is examination week, and you must get me well." And so, day after day, if the sickness last so long, comes this pitiful cry, while the anxiety, of which it is the index, adds sensibly to the feverishness, or gives character to its delirious mutterings, or to the dreams of its disturbed sleep. Nor has it seemed to be that it mattered much whether the invalid were in the primary grades or the high school; the same feverish anxiety has been all pervasive.

And if convalescence did not take place promptly enough to let the examination be taken, then has the poor child been compelled to worry through its vacation with the impending examination—like the sword of Damocles—serving to give bitterness to every cup of joy and robbing his sports of half their zest.

Are such examinations necessary? Are they an essential feature of our school system—a *sine qua non*—a necessary evil?

There seems to be two kinds of examinations: the one conducted without previous notice—hence with all the mercies of the lightning stroke—and which serves merely as a test of the child's work; a guide to the teacher, revealing weak points in the methods of instruction, and an aid to the superintendent in determining the faithfulness and efficiency of the teacher; but such an examination has nothing to do with determining the child's grade or rank, or with his promotion. Such an examination is usually called a test, and I shall so call it.

The other examination is a formal one: the date of its occurrence is known for weeks beforehand; it is held up, menacingly, by the teacher, as pregnant with direful possibilities of evil; and it is used chiefly—and entirely in the belief of the child—as the means of determining, irrevocably, his class standing and his promotion.

Such an examination is usually called by that name, and I shall retain it.

It is not necessary for me to enlarge on the arguments for and against examinations; they are, or could be, familiar to you all. Those in their favor I have already outlined. Against them it is argued, in the language of President Hyde, of Bowdoin College, that "they foster in the pupil nervousness and disease; intermittent strain rather than steady advance; superficial and hurried cramming, rather than substantial and permanent progress; the cultivation of a particular kind of smartness, rather than a firm and thorough grasp of knowledge; they beget in those who are gifted by nature with an abnormal preponderance of partitive memory a shallow vanity in its possession, and they give over to discouragement and disgust those in whom nature has so mixed the intellectual elements as to render them good for something besides the passing of examinations. They rob teachers of originality and independence, and strip instruction of all spontaneity and inspiration, inducing in their place uniformity, constraint, routine, servility and deadness. In so far as superintendents rely upon examinations for their estimate of the work of pupils and teachers, they are sure to be misinformed; their grading will be one-sided and unfair; the precocious adepts at verbal memorizing will be pushed ahead so fast that they never will master any thing, while the slow substantial plodders, who take time and pains to assimilate what they learn, will be compelled to go over the same ground so often that they will be discouraged and drop out before the course is finished."

To this arraignment may be added, that examinations tend to induce cheating, this tendency increasing with the increasing years of the pupils, and hence their ability; and that they interfere, to too great a degree, with the vacation hours of the teachers, who are compelled to devote to a discouraging pile of examination papers, the hours which should be devoted to study or recreation.

Where there is diversity of opinion there will naturally be diversity of practice, and we find that in some schools examinations are the only means of determining standing and promotion, while in others examinations are abolished, and the grading determined by the daily work of the pupils; while in still others the examinations are

used, but only in a subordinate degree. In our Columbus schools, I believe, examinations count one-third, daily work one-third, and habits of application one-third. This is an innovation on our former custom, and, I think, a decided improvement; but an examination, in the child's view, is an examination, whether it is to count as one-third or as the whole; and I have not found that the change has in any degree diminished the anxiety or worry of invalid pupils, or the worry and cramming of those in health.

The so-called tests are essentially free from all objections. They are sprung upon teachers and pupils without warning, thus avoiding all the miseries of apprehension, and giving no time for cramming. As a means of determining the advance made by the pupils, and the ability and fidelity of the teacher, they are vastly superior to the examinations, while properly used they possess all the educational and stimulating value of the latter. They count nothing in determing promotion, hence absent pupils have no cause for worry. By means of these tests the superintendent is able to maintain an essentially uniform standard throughout the schools, so as to allow no departure from proper classification.

Questions that are to determine the promotion of a pupil can not, in fairness, go outside of the lessons learned during the term, but questions in a test can be so selected as to serve as a means of determining his ability to apply what he has learned. The mere apprehension of knowledge is one thing, its application and comprehension distinctly another.

Says Prof. L. W. Day, of Cleveland: "The right of promotion rests upon mental growth and development; upon the ability to perceive, to understand, to do; and not upon an ability in childhood to answer any ten questions that may be properly given to the most learned superintendent in all the land."

If 70 per cent. in examinations be taken as the dividing line between success and failure, between the sheep and the goats, it is morally certain that among the pupils who stand between 60 and 70 per cent., or perhaps between 50 and 70 per cent., there will be a number who are better fitted for promotion than some of those who rank well beyond the critical line.

Says Prof. Day: "The judgment of the careful and competent teacher should certainly count for much." I would say, "for all." Careful and competent teachers are numerous; there is no excuse for the employment, by any board, of the careless and incompetent; and any superintendent who is unable, even without the use of these tests, to discover such incompetent teachers shows himself to lack a qualifying knowledge of human nature; or, if knowing such incompetent teachers, he fails to report them for decapitation, in good Democratic fashion, he shows himself to lack a qualifying firmness of character, and in either case the sooner he resigns the better for the schools.

In our treatment of the insane we have long since relegated to the garret of our asylums the manacles, the cage and the straight-jacket, for our modern remedies secure the desired end in a better way. The lancet has also gone, for we now accomplish depletion without loss of the precious fluid which was so ruthlessly wasted by our fathers. The brutal appliances of the past generation of surgeons are now found only in the dusty recesses of college museums.

Is it not time that our modern methods of education should send to the lumber in the attic this relic of medieval educational methods, this procrustean bed, yclept examinations?

THE VENTILATION OF OLD SCHOOL ROOMS.

J. W. Yost, Architect, Columbus, Ohio.

[Read at a joint meeting of the State Board of Health and Superintendents of Public Schools].

My subject begins with the school-room where no provision has been made for changing the atmosphere—where the same air is breathed over and over again, until some chance opening of the door or thoughtful movement of a window, permits a quantity of the inner and outer air to change places; it ends at the carefully planned and constructed room, where a sufficient quantity of pure air is admitted, and that which is vitiated is removed without inconvenience to any occupant of the room.

Between these two extremes we have every species of more or less imperfect ventilation, and included in the number of rooms thus imperfectly ventilated are more than half of the school-rooms in Ohio at this time. A recent statute provides for the ventilation of all the buildings for school purposes hereafter to be erected, but what is the remedy for existing rooms where ventilation is required?

A search for the remedy may properly begin by an inquiry into the cause of the present lack of ventilation.

Among the chief reasons why the old rooms are not better ventilated is the failure of the public in general, and boards of education in particular, to fully appreciate the importance of having pure air in rooms where the children spend a large share of the years of their most rapid, physical and mental development.

The cost of ventilation is not so great, nor the subject of ventilation so abstruse or mysterious as to preclude the most financially straitened school district from having a well-ventilated building, but it is not generally supposed that any real necessity for ventilation exists, and the smaller the building the less it is imagined that any ventilation is required. The feeling has been, and in many cases still is, that ventilation is rather a good thing to have, if it does not cost much or spoil the school-house. Many persons remember that we heard but little about school-house ventilation in our school days, and regard it as sort of a modern luxury.

This failure to properly estimate the importance of ventilation is the chief obstacle in the way in the cure of old rooms. Let any board of education decide that the building under its control shall be properly ventilated—ventilated as now required by statute for new buildings—and no serious obstacle will be found in providing a sufficient quantity of pure air, to be admitted in manner and condition conducive to the welfare of the children. The necessary cost will be found to be surprisingly small, even though the building has been erected without any provision whatever for changing the air in the rooms. I do not mean by this that it will cost nothing at first, nor that it can, without any attention or expense, be kept in operation.

Like every other thing of value, it will cost something as a first outlay, and something in attention afterward; and like other things, the appliances which are the cheapest at the outset will not be found to be those easiest kept in satisfactory operation.

I have never known of a case, and can not imagine one where, with reasonable outlay, good ventilation can not be secured. I say, therefore, if these buildings remain as they now are, it is not because we can not, but because we will not ventilate them.

For the purpose of considering the question of ventilation, old school rooms may be divided into three general classes.

A type of the first is the one heated by a stove; the second type is the room warmed by a hot air furnace, and the third is the room warmed by direct radiation of steam or hot water.

In the first class nothing in the way of ventilation is attempted. The draft of the stove, when there is a fire, serves to exhaust the air via the smoke pipe, and causes it to be replaced via every crevice about the room, where the air can be drawn in.

In rooms of the second class a certain amount of highly heated air is supplied to the room by force of the difference of density between warm and cold air. In these there is a tendency to drive the air out at the crevices where, in the former case, it was brought in. The rooms of this class are often supplied with a small escape flue, intended to carry off the vitiated atmosphere.

In class No. 3 there is no attempt, mostly, to change the air in the room. Its temperature is restored by the radiator as rapidly as lost, and those in the room breathe the air over and over again.

Rooms of the first class are at a fault because air is introduced at improper places, in improper condition, and in insufficient quantity, and in passing the air over the surface of iron at a high temperature, it is rendered unfit for breathing, besides resulting in an uneven temperature in the room, being lowest where most air is admitted and furthest from the stove, and high beyond comfort in the immediate vicinity of the fire.

Rooms of the second class fail, to a greater or less extent, in proportion to the higher or lower temperature of the iron over which the air passes, and the more or less efficient means of discharging the vitiated air from the room.

In many cases the air is partly freed from its natural state of humidity, and to that extent rendered unfit for breathing.

In the third class the rooms become objectionable because they are not ventilated at all.

It is important that we keep before our minds the main requisites for ventilation, and that we keep them independent of any kind of appliance or machinery.

First—We wish to supply the average school room with at least six cubic feet of pure air, at a temperature ranging between 60 degrees and 200 degrees F. every second. A like amount, of course, must be emitted from the room—three-fourths via flues and one-fourth via crevices.

Second—The air must be so introduced and extracted as to avoid a velocity of more than three feet per second, where the air comes in contact with persons in the room, and so that the temperature in the room, at equal distances from the floor, shall be practically equal.

Third—Through all that portion of the year when outside temperature is below 70 degrees F., the air is to be warmed before coming in contact with the occupants of the room. This requires it to be introduced at 70 degrees or more. The average temperature in the room not being over 70 degrees, the air is emitted at its lowest temperature, consequently it is to be taken out at the bottom of the room, and near where it is at last reduced to a temperature too low for comfort—that is, usually near doors or windows. It is a matter not so important whether the air, if admitted at a temperature materially higher than that in the room, be admitted at the top or bottom, as it will at once pass to the ceiling in either case, and it is less important in proportion to the increase in the difference in temperature between the current admitted and the air of the room.

Fourth—When the outside temperature is higher than 70 degrees Fahrenheit the temperature in the room is rendered unpleasant by an increase of temperature, and the best place of escape is the highest point in the room—above where the air receives its greatest increase of temperature. Its admission will naturally be at the lower part of the room and furthest from the point of its escape.

Apply these facts to the solution of the problem presented by the three classes referred to.

The solution is then not so perplexing as the question of which one of different available expedients to suggest. This depends upon the amount of money which can be expended, the degree of permanency sought, and how far the authorities may be will-

ing to avoid future care and expense by the more costly and perfect machinery adopted. Nothing will be attempted here, except to suggest some very inexpensive appliances and to remark that the machinery which is the most enduring and nearest perfect is always most satisfactory in operation, even though more costly in the beginning.

In all of the above cases the ventilation is most likely to be attempted by using the currents which can be created by changes in atmospheric temperature, without the use of driving machinery, such as fans, etc., and for the present no suggestion will be made concerning warm weather ventilation. In all the above named classes an insufficient quantity of fresh air is admitted, and as a greater quantity of air must, in cold weather be brought up to the required degree of temperature, it will be found in nearly all cases that the heating apparatus provided is insufficient, and in most cases needs to be increased by 100 per cent. or more, of present capacity. This in the first two classes will be all the more necessary because one of the requisites should be that no air to be breathed in the room should pass over iron at even a glowing heat, and the air should not in any case be raised to the boiling point of water.

For rooms of the first type, something like the following may be suggested, not as the best, but as the easiest. Put in a stove of, say double the capacity of the one in use. Case it up furnace fashion—with galvanized iron rings—admit the air by means of a duct of four feet area from the outer wall, admitting it under the stove to the outer chamber; leave this chamber partly open at the top; at the corners of the room put in ducts—extending from the floor to the attic—these ducts to equal three feet area with equal capacity of openings at the bottom, and a door so that a large lamp can be placed above the opening. By closing up the attic, where possible, to prevent the entrance of air from the outside, and then putting a ventilator at the highest point of the roof, by keeping the lamps—which may be large sized carbon oil lamps—burning an apparatus for ventilation will be constructed at a very moderate cost.

For class No. 2 increase the furnace capacity, say 100 per cent. and then double case so as to prevent iron, where the fresh air passes, becoming hot, and introduce an evaporator to restore the humidity of the atmosphere. Put in an inlet for cold air, of four feet area, opened at the bottom of the room, and place gas jets or large lamps in the vent flue above the opening.

For class No. 3, increase boiler power, say 50 per cent. and radiating power 25 per cent. Place radiators beneath windows and register back of them equal to four feet area. Then at the bottom of room opposite, put an opening of three feet area into vent flue—of equal size—which must extend upward to the open air above the building. Place gas jets or steam coils, above the opening, in the vent flue.

These suggestions are made for classes and in a general way, and would, before being adopted in each case, need to be governed by local peculiarities; but the foregoing will announce the things which are required, and bring to mind suitable means for carrying them out.

APPENDIX II.

PROCEEDINGS OF A MEETING

OF THE

STATE BOARD OF HEALTH

AND

LOCAL BOARDS OF HEALTH OF OHIO,

HELD IN

COLUMBUS, OHIO, JANUARY 29TH AND 30TH, 1891.

REPORT OF THE PROCEEDINGS OF A MEETING OF THE STATE BOARD OF HEALTH AND LOCAL BOARDS OF HEALTH OF OHIO, HELD IN COLUMBUS, OHIO, JANUARY 29 AND 30, 1891.

A joint meeting of the State and local Boards of Health was held in Columbus, January 29 and 30, 1891. The attendance was encouragingly large, and the program one of unusual interest. By a unanimous vote of the convention the State Board was requested to arrange for holding annually meetings of this character.

The following is a list of the representatives present who registered; several whose names were not learned failed to register:

LIST OF REPRESENTATIVES REGISTERED.

Dr. C. E. Beardsley, H. O.	Ottawa.
Dr. A. Berchtold, H. O.	Defiance.
Dr. S. P. Bishop, H. O.	Delta.
Dr. G. W. Burnett, H. O.	Greenville.
Mr. T. S. Campbell, Sec'y	Fostoria.
Dr. T. T. Church, H. O.	Salem.
Dr. D. W. Collison, H. O.	Glouster.
Dr. G. C. Collamore, H. O	Toledo.
Dr. S. A. Conklin, State Board	Canton.
Mr. James Cunningham	Massillon.
Mr. Arden Dale, Mayor	Oberlin.
Dr. A. D. De Haven, H. O.	Xenia.
Dr. A. J. Gaskins, H. O.	Sabina.
Mr. John Y. Glessner	Mansfield.
Dr. C. P. Gray, H. O.	Madisonville.
Mr. Charles Hiler	Norwalk.
Dr. H. C. Houston, H. O	Urbana.
Dr. Thos. C. Hoover, President State Board	Columbus.
Mr. M. N. Hoye	Akron.
Mr. George P. Hunter	Warren.
Dr. W. C. Hunt, H. O	Warren.
Dr. Webb J. Kelly, H. O.	Galion.
Mr. George Keller	Mansfield.
Dr. A. A. Kohler, H. O.	Akron.
Dr. Edwin Le Fevre, H. O	Sidney.
Dr. J. W. Lewis, H. O	Lancaster.
Dr. W. F. McLean, H. O.	Elyria.
Mr. J. M. Merrill	Mansfield.
Dr. Wm. T. Miller, State Board	Cleveland.
Dr. T. Clarke Miller, H. O	Massillon.
Mr. W. H. Miller, Mayor	Akron.
Mr. Thos. L. Morris, Mayor	Xenia.

Dr. N. K. Moxley, H. O ..... Ironton.
Dr. T. J. Mullen, H. O ..... New Richmond.
Dr. A. W. Munson, H. O ..... Kenton.
Dr. A. A. Nefe, H. O.. ..... Whetstone.
Prof. E. T. Nelson, State Board ..... Delaware.
Dr. R. M. O'Ferrall, H. O ..... Piqua.
Dr. C. O. Probst, Sec'y State Board ..... Columbus.
Dr. R. Harvey Reed, H. O ..... Mansfield.
Dr. D. H. Richardson, H. O ..... Celina.
Mr. Joseph Shantz ..... Mansfield.
Dr. H. J. Sharp, State Board ..... London.
Mr. B. F. Slater ..... Van Wert.
Mr. Chas. Sorg ..... Mansfield.
Mr. D. H. Squire ..... Ashville.
Dr. Elwood Stanley, H. O ..... Sandusky.
Mr. A. D. Strong ..... Ashtabula.
Dr. O C. Stutz, H. O ..... Upper Sandusky.
Dr. D. V. Summers ..... Shelby.
Dr. H. T. Sutton, H. O ..... Zanesville.
Mr. A. G. Thornton ..... Mansfield.
Mr. John V. Van Atta ..... Mansfield.
Mr. John H. Van Stein ..... Upper Sandusky.
Dr. Joseph Wagner, H. O ..... Gambier.
Mr. C. P. Washburn, H. O ..... Delphos.
Mr. J. M. Waugh ..... Mansfield.
Dr. J. E. Whitmar, H. O ..... Millersburg.
Mr. C. E. Whittington, Secretary ..... Shawnee.
Mr. E. W. Wiese, Secretary ..... Akron.

FIRST SESSION.

The meeting was called to order at 9 A. M. by Dr. Thos. C. Hoover, President of the State Board of Health, who spoke as follows:

"As you have doubtless noticed on the program, which has been very generally distributed and perhaps sent to all local boards of health throughout the State, the object of this meeting is the bringing together of those persons in the State who are interested in sanitation, in order to secure better co-operation and more thoroughly organized work throughout the State, thereby accomplishing more toward the prevention and restriction of disease than has been heretofore possible.

"We are gratified to see so many present, yet disappointed that we have not a larger attendance. We recognize the fact, however, that many men who are health officers and members of local boards are prevented from attending on account of business affairs, which can not always be easily set aside.

"We hope to have an interesting meeting; it certainly will be interesting to all here to exchange views on the topics presented, and we trust that each and all of you will feel free to speak your opinions whenever opportunity offers, and we will try to make those opportunities frequent.

"I want briefly to say a few words about the State Board of Health since its organization. Those of you who are members of local boards and who are health officers, know that it is not an easy thing to educate the people up to the importance of proper sanitary regulations. It is a great deal like vaccination. People as a rule will not be vaccinated until their is immediate danger of small-pox. Whenever small-pox is next door, then the most pugnacious anti-vaccinationist will yield readily to vaccination. So in regard to all other infections and contagious diseases. Whenever a man's family is threatened, he is ready to take all precautions against the possibility of danger, when it is oftentimes too late.

"Nevertheless, we feel that we can congratulate ourselves upon the work accomplished, though limited in appropriations and discouraged by lack of co-operation from the people in many parts of the State. Prior to last year there were less than thirty working local boards of health in the State of Ohio, but we secured last year the enactment of a law which has resulted in the creation of a number of additional boards, so that there are now three hundred boards in the State; and all this, we feel is directly due to our exertions.

"The character of the work done by local boards is improving every day. This is doubtless due to the increase of knowledge necessary for the kind of work that is expected of them. As they become better informed as to what their duties are, they are more able to do this work intelligently and successfully.

"Whenever an outbreak of contagious or infectious disease has occurred in a town having a local board of health that is alive to its duties, it has succeeded in restricting the disease to very narrow limits; it has been controlled with wonderful success. We have in several instances secured the organization of a local board as the result of an outbreak of some contagious disease. In several instances our assistance has been invoked when a disease had broken out in a town and had become almost epidemic, and by this danger we have secured the organization of a most efficient board. Whenever that has occurred, the importance of the board has impressed itself upon the citizens and we feel that we have gained a permanent footing in that corporation.

"Year before last there were fourteen outbreaks of small-pox in the State of Ohio. I presume that quite a large proportion of you are not aware of that fact, although you might be aware of the fact that there were some cases. In no single instance where our instructions were properly carried

out—and we were promptly notified in each case—did the disease extend beyond the house in which it first appeared. We know that small-pox is one of the most virulent diseases that we have to contend with, and only by the prompt, efficient measures resorted to at once was the extension of the disease prevented. We have a supply of good virus constantly on hand, which we will send to any part of the State on short notice if small-pox breaks out.

"One of the first things that the Board did was to print a number of circulars on the methods to be pursued in the prevention of the spread of certain infectious diseases. We have distributed many thousands of these, and are receiving almost daily, letters from different portions of the State thanking us for the circulars and expressing great satisfaction with the effect which they had produced. We expect to continue this work right along. We want the local boards to feel that we are "one of them." We have a secretary here, whose business it is to assist any of you that may require assistance. Of course, we don't presume that all of you need instruction in this line, but many do, and we are always ready to give help when asked for it.

"We have been compelled by lack of funds to refuse to respond to a number of calls that have been made in the last year. We asked for a certain amount of appropriation and were cut down. Our work has wonderfully increased; we have had many applications from different places to visit them, either for the purpose of aiding them in the organization of a local board, or in the restriction of some infectious disease, but have been compelled to refuse because we have no money.

"You are aware of the law, and a very wise one it is, indeed, that prevents us from creating a deficiency, and we have labored to keep within the appropriation; but we have this year been obliged to ask to be allowed to create a small deficiency. I think it is a false sort of economy to restrict a board of this kind to less than five thousand dollars a year. Just think of it! Less than five thousand dollars a year to conserve the health of the great State of Ohio. It is simply ridiculous! There isn't a State in the Union that compares with us in the extent of territory, in population and in prosperity, that does not spend more than four times that amount every year. We were cut down three hundred dollars, because we had a balance on hand of a few dollars. As a matter of fact, we did not have a balance; there were outstanding bills that more than consumed that amount. But it seems to me a small sort of economy that cut off three hundred dollars from this appropriation.

"In several cases the value of this Board has been proven. At New Washington there was an outbreak of small-pox, and it was quarantined by the United States Postal Department, who gave instructions that no

mail was to be received from New Washington, though mail was permitted to be delivered there. The quarantine could only be raised by the State Board of Health, after satisfying itself that proper precautions had been taken against the spread of the disease. Now, you can figure for yourselves the probable cost to New Washington of such a state of affairs. Many dollars would have been lost but for our interference. We have saved many times over the appropriation that has been granted us. We hope to secure a larger appropriation this year, but can not say whether we will succeed.

"I have taken more time than I intended when I commenced speaking and have made this statement for your enlightenment as to the work we have been doing since our organization.

"On the program for this morning are five papers. After the reading of each paper time will be allowed for discussion, and it would perhaps be best to first fix the limit of time to be allowed for remarks to any member."

Dr. Reed—I would like to inquire who are members of the Convention, and have a right to the floor in discussion.

President Hoover—I feel that all present are interested in the matter of sanitation, and by the interchange of views we may all profit, so that any one present may have the right to participate in these discussions.

Dr. Conklin—I move, Mr. President, that we limit the time of discussion to three minutes.

Motion seconded and carried.

President Hoover announced the first paper, and introduced Dr. T. T. Church, health officer of Salem, Ohio, who read the following paper:

THE INSPECTION OF SCHOOLS AND SCHOOL-HOUSES.

By Dr. T. T. Church, Health Officer, Salem, Ohio.

The Revised Statutes of Ohio, in granting power to, and defining the duties of boards of health dismiss the subjects of this paper in a very few words, merely saying that they shall inspect the school-houses semi-annually.

Sanitary science, though centuries old, and even as taught by Moses can be practiced now with benefit to humanity, seems, in the last few decades to be awakening from a long slumber, and where, next to the home, could its teachings be impressed upon the minds of the rising generation to better purpose than in the school and on the school grounds? Beginning at the tender age of six years, when the reflective faculties are just developing and the observing ones are in full operation, as testified to by the numerous questions and the very oft repeated one *why*, until one verily believes the child has changed himself into that crooked little thing that follows an interrogation, he is sent to school and must pass a certain number of hours during a certain number of weeks each year until he has almost reached the age of maturity, and if he continues his study at some college the influence of school life remains with him until full development has been maintained.

Schools themselves have altered in appearance and construction, and from the old log houses of the country district, they range from the frame or brick buildings of one room now in the country to the large city buildings of brick and stone; from the log building with one huge red-hot stove in the center and the snow sifting in through the cracks, of the olden time, to the tightly closed overheated room of the present day; from the building set in some low part of a farm which is too wet to be cultivated and where the children must wear rubber boots to wade through the mud and water in order to reach the school, whose surroundings remind one forcibly of a hog pen, and possibly remain during the session with damp garments, to the comfortable building in some high and dry location, where grass will grow in the yard and the children can romp and use up superfluous energies during the recess and noon times, laying by a store of health for use later on in life.

The State law now makes it compulsory that every child between certain ages must spend a part of each year in school, there to learn that which will change him from an ignorant, down-trodden creature, if allowed to grow without it, to a self-respecting, intelligent citizen of the commonwealth; but if in getting this mental education his health has been undermined, what has he gained? Hence, as a complement to the compulsory education law, comes the section, or rather part of a section that the board of health shall inspect the school-houses semi-annually and see that they are fit for occupation, as the school law drops the subject by saying the building shall be suitable, leaving it to the judgment of the board of education to determine what suitable is.

Many of our buildings are constructed with no means of ventilation except that furnished by opening the doors or windows, and in winter when the air in the room has been breathed several times and the moisture completely dried out of it, a window can not be raised or lowered without causing some one to complain of the draft and cold. The rooms should have some adequate method of ventilation, that a sufficient quantity of fresh air be continually admitted without subjecting any pupil to an unnecessary draft.

The rooms should be maintained at an equable temperature, and 70° F. is none too high where the children are sitting quietly studying at their desks, and in order to know the temperature of the room a thermometer is absolutely needed, as a human one is liable to too many fluctuations, It is preferable that the heating should be accomplished from some central place for the sake of economy and cleanliness, as less fuel will be consumed when used for steam, hot air or water heating than when burned in grates and stoves, and not so much dust will settle over the rooms when it is not necessary to carry in coal and take out ashes.

Another very important matter is the supply of light which should be abundant; but how often do we read of examinations of the eyes of school children showing an increasing percentage of myopia as the advance is made from the primary to the higher grades. The light should come from the left side and back of the pupil and in sufficient quantity to thoroughly illuminate the room on a cloudy day, for too much light can easily be excluded by shutters or curtains while a deficiency can only be remedied by an expensive alteration of the windows and walls.

Comfortable desks should be provided and not too many in one room, and the scholars allowed to assume comfortable positions in them.

Light calisthenics would be an agreeable diversion, when the windows could be opened for a few minutes enabling all to get a good breath of fresh air and to quicken any sluggish blood in its circulation. This exercise need not add any additional expense to the schools as much good can be done without the aid of any apparatus.

The cellar should also have attention; it should be known that the drainage is such as to carry off any storm water that may get into it and that it does not remain damp; it should not be used as a general dumping ground for all waste of the rooms above, but should be dry and clean, and where a better place to provide an in-door play-ground for inclement weather? From my limited experience this is an unheard of luxury.

What shall we imagine the feelings of a child to be, taken from a home of refinement where sanitation is observed as a common every day affair of life, and sent to one of our public schools, of which we are wont to boast, because we recognize that in order to sustain our government we must have the common people intelligent, able to think and act for themselves, when, on his arrival he finds a large or small yard littered over with rubbish or waste paper from the various rooms, muddy and dirty, through which he must go to the door where he finds affairs equally bad; no conveniences for cleaning the mud or snow from his feet; the halls and stairs showing numerous tracks or covered with dust and dirt, and on entering the school room there also to discover dust on the floors, desks and blackboards; if in winter, the room overheated and the air stifling with the emanations from the many lungs and bodies of the overcrowded room, and a good headache, if nothing worse, the result of remaining through one session. If it is necessary to answer the call of nature, and this with some children frequently occurs from sheer nervousness, he may be told that he must wait until the session is over or until some other pupil who is out, has returned. Finally, when permitted to leave the room, he goes to the closet, there to find every thing in the nastiest condition possible; the odor or rather an absolute stench greets him, or to put it stronger, in the words of a Scotchman "he feels a smell" before he enters the building, and it is not to be wondered at for the troughs or vaults are well filled and the seat and floor are also covered, so that it is hard to get inside without soiling the shoes and utterly impossible for any respectable boy to use the seat. Of drafts, the less said the better, for he might easier stand the necessary exposure in some field and run less risk of getting chilled. Taking such conditions as these into consideration, is it a cause for surprise that constipation with its attendant evils is a frequent occurrence, or that organic affections of the kidneys are common? In case our boy wants a drink, a very rational thing after breathing vitiated air until the mucous membranes of the nose, mouth and throat have become dry and inflamed, possibly he is told he can not go out so often if the pump or hydrant happens to be in the yard, his chances being better if there happens to be a water supply in the room, but if the pump or hydrant is in the yard, as soon as the pupils are dismissed for recess there is a general stampede for the water, and then a scramble takes place as to who shall have the first drink; possibly there may be a tin cup, but probably not, and the children must help themselves as best they can with nature's implements.

I do not think I have overdrawn this picture, but that it can be duplicated in many school premises.

While writing this paper I received a reporter's account as published in the daily paper, of a trip he made with the health officer, who was inspecting the schools in one of our flourishing cities, and I think a few quotations may serve to point a moral in the supposed case I have just tried to describe. Speaking of drinking water, he says at one building: "The drinking water here is supplied by a hydrant on either side of the building, and at recess there is a grand rush for a drink. Several times this winter they have been frozen. In one or two rooms the thirsty were watered from a tin pail. Progressive farmers allow their stock to have access to water when they want it. Why shouldn't growing children have the same privilege? Why is there not water in each room where it belongs?"

At another building "Water was pouring out of both hydrants and not a tin cup or any other drinking cup in sight, the inference being that the pupils drink with the facilities given by nature. One child said that no tin cups were supplied. 'Why, we just lean over and let the water run into our mouths as it comes out,' said he, as though that were a matter of course."

In speaking of the closets part of his comment is as follows: "This out-house was simply awful. The ground in the entry was covered with frozen urine, feces and slush. Not one seat was fit to be occupied, as all were covered or stained with feces. Piles of feces were here and there in a dozen or more places on each floor, mixed with frozen urine, snow and mud. The smell was worse than in the female closet. Trough two-

thirds full. An unfit place for children under any circumstances. If this bad in midwinter what is its condition in summer? One ten-year old boy when asked if he ever went to the closet said: 'No, and sometimes I get the headache because I wait. I won't go in that dirty place.' Another said: 'Sometimes I have to. My ma scolded me because I got my feet dirty in there once.' And so on. No paper is apparently ever used. The excuse that it can not be kept clean is no excuse at all, because, after we left this building we were shown the closets in a new school-house. These are what are known as dry closets. They are located in the basement, and the atmosphere is pure and warm. No smell whatever comes from them. The seats are perfectly clean. Paper is provided." At another building he says: "The female department was in worse condition, having ice on most of the seats and no glass in the windows. The weather was kept out and the foul odor kept in by double wire screens. The male department was a sight to see. Every seat was covered with frozen urine and feces. Is there any wonder that the entry outside would be used in lieu for both purposes? Nobody seems to know how often these dirty houses are cleaned. The indications are that this ceremony is not performed frequently. One pupil said that the closets were not cleaned on an average once a week. Another said: 'You ought to see them some times in the summer! The kids do about as they please. The weather's too cold now for them to go out here and make a muss.'"

That is surely an object lesson in sanitary science, but what a lesson! The present tendency in education is on the line of kindergarten methods; but what a sample is this to put before our boys and girls; as far as closets are concerned, a little better on the girls' side than on the boys,' and therefore the worse, as by natural inclination the boy is more of a savage than the girl and needs more training to make a respectable member of society. If, by observation, much can be learned, and without doubt that is the easiest way for a school child, why should not the water-closet be properly kept, the floors clean and respectable, the seat so that it can be used, and paper provided? In other words, why should we not teach the child to attend to the wants of nature in a proper sanitary way and not in such a manner as to shame the lower animals?

Since beginning this paper I took occasion to personally inspect our school buildings one Saturday morning as I wished particularly to see the closets and cellars. We have two regular school buildings and two others used temporarily until a third school building shall be erected, and after that morning's trip the conclusion was forced upon me that much depends upon the janitor, for in only one place were the closets in a respectable condition, and here the janitor apologized for their appearance, saying he had not yet given them their weekly scrubbing out. At this place they received some attention; at the others apparently none. Last Monday our board visited one of the school buildings and we found the closet in much better condition than when I went alone. The place had been scrubbed out and no piles were on the floor. We were told that the boys were not altogether responsible for the state of affairs I found, but that outsiders came in at nights (the building could not be locked) and caused the trouble.

In one of the cellars I found a room dry, well warmed and lighted and the walls nicely whitewashed and was told the pupils who carried their dinners came here to eat them, and so, if the janitor makes the proper effort, the cellar can be clean and dry and the closets respectable even if boys do use them.

Nothing has as yet been said in regard to the necessity for having fire-escapes, and while they are important, more damage results from imperfect heating, lighting and ventilating.

There is one point which may not come directly in the line of duty of a board of health, and yet as the boards are created to preserve the public health it seems to me they would not strain a point too much if they cautioned parents in regard to sending their daughters to school during the changes incident to the time of puberty, for what profiteth it a woman, if in getting an education she has lost her health and must remain an invalid for years?

In closing, the work of a board of health is now generally engaged in the inspection of school-houses after their erection, but it undoubtedly would be a great saving, if before the plans for a new building are accepted, they should be submitted to some competent sanitary authority in order to determine that all the details as to heating, lighting, ventilating and plumbing had received proper attention.

DISCUSSION.

President Hoover—The paper is before you for discussion.

Dr. Reed—Mr. President, the paper just read by our friend from Salem is not only interesting, but one that we should take to heart, so to speak. The question of inspecting the sanitary condition of school houses is in its primeval state. Little has been done in this direction, and the fact that these conditions which he has detailed, are found, is sufficient evidence that we should take more interest in taking care of this part of the property of the city than we have done in the past.

The quotation that was made in the paper just read, was taken from one of our papers, and while it is not very flattering to our city, I will own it is true. I will admit that this matter had received no attention prior to three years ago, but we are looking after it now. The condition of our closets is inexcusable. In the first place our school board has not furnished proper closets, but in our new building we have sanitary closets, and are going to put in dry closets. We have one, which is perfectly satisfactory.

Nothing is more degrading than for a child to be obliged to go to a closet that is too filthy to keep hogs in. It is vulgar in every sense of the word, and there should be a clean and comfortable place where the child can learn cleanliness while using the closet. In these filthy and uncomfortable places children contract serious colds. I have known cases in my own experience that I could trace directly to this cause. If you allow the fresh, cold aid to blow on your face without any protection, you will catch cold, and this is just as true of other parts of the body. We must improve our school-houses in this regard, or suffer the consequences.

Dr. Probst—When we consider the fact that there are over a million school children in our State going to school nine months out of each year for ten or twelve years of life, it will be seen that it is especially important that this question should be carefully considered. More especially is this true, as bad sanitary surroundings have a much worse effect upon children than upon adults.

There is one thing to which I wish to call attention: The law says that boards of health shall inspect schools and school-houses, and this would seem to indicate the intent of the law to be that scholars, apart from school-houses, are subject to inspection. There can be no doubt that

grave evils could be overcome by an intelligent inspection of the pupils by competent members of boards of health. This is now being done in many European cities and in one or two of our Eastern cities, by the appointment of medical inspectors of schools, and much good could doubtless be done in this direction by boards of health.

Two years ago, in answer to circulars sent out, thirty-three per cent. of the boards of health in the State reported that they had not inspected the school-houses during the year. The answers to circulars received last year show that only twenty-five per cent. have failed to make such inspections this year, although there were more boards represented, showing that the boards are becoming better educated as to the importance of the inspection of school-houses.

I intended to have here to show you, a little instrument which has been recommended by Dr. Abbott, Secretary of the Massachusetts State Board of Health, for measuring the impurities of the atmosphere. This little instrument is called Wolpert's air tester. The price of it is but two dollars, and while it is not claimed to be absolutely accurate in its results, I think it is sufficiently so to judge of the ventilation of a school-room.

Dr. O'Ferrell—I wish to make a few remarks respecting our school-houses. In all of them we have the Smead system of dry closets, and our board, upon inspection of these schools, was especially impressed with its efficacy. Our closets, which are of iron, are in the cellar. In this system, the hot air passing over the fecal matter, dries it completely, until very little is left, and all is carried away by a high shaft. These buildings were designed by Mr. Yost, of this city, and are built in such a manner as to light each and every room in a proper manner.

Mr. Morris—I am very much impressed with the idea of having a thermometer in each room of our buildings for the purpose of regulating the heating, and think it would add much to the comfort and health of the children. Think it would be well for the board to take action on the matter of providing thermometers for each room, and fixing the temperature at which the atmosphere of the room should be kept.

Mr. Strong—We have built three school-houses in the last four years. In two of them the Smead system was put and found so satisfactory, that it was also placed in the third. The question to which I rise is: How are we going to ventilate our country school-houses? Is there not some way in which this organization can reach them? I know from experience that the system of ventilation in these schools is simply abominable, and would like to know if some way of ventilating country school-houses can not be suggested by which the children will not be exposed to undue draft. One easy method is to fit a board tightly in the bottom of the

window, then raise the window a little and let the draft be between the two sashes at the top—but I hope a better method may be suggested.

Dr. Church—In a conversation which I had with another physician the other day, he told me that he had been called to visit a country school-house, and found there a red-hot stove in the center of the room, and the children sitting screening their faces from the intense heat. He suggested as a remedy that a drum of sheet-iron be placed around the stove, open at the bottom, sending the current of hot air out at the top. The rooms of our buildings are all provided with thermometers, and on visiting them on Monday afternoon I found the range of temperature to be from 61 to 68 degrees. In regard to out-houses, our superintendent stated that he was waiting for the town to get sewers in, when he thought the closets could be much improved.

Prof. Nelson—At a meeting held last April in this city, a joint session of the State Board of Health and the Superintendents of Schools, Mr. Yost, of this city, in an article on "The ventilation of old school-rooms," presented plans for heating and ventilating country school-houses. I cannot describe them, but the paper was published with the report of that meeting, of which there are, perhaps, some copies remaining. If not, I would suggest that it would be well to have the same reprinted with the report of this meeting.

I should like to ask a practical question. Our school-houses must be inspected, so the law states, but what else have we authority to do? We have the authority to make inspection, authority to point out evils, but have we succeeded in abating nuisances when found? A short time ago, I spent two days in the city of Bellaire, this State, and I must tell what I saw there as I came by the school-house. The lot was, perhaps, six inches below the sidewalk, and as a consequence water stood from two to three inches deep in the yard. There was one little space about the size of this platform that was dry. There were some three or four hundred children in the yard and their game was to get on this dry place, jump off, and play "tag" through the mud. Imagine what the condition of those school-rooms would be after the children have been running through all this mud and water. Now, who has authority to act in such cases? When I spoke of the condition of this yard to the superintendent, he said they could do nothing with it *because the lot was a little lower than the sidewa k.*

Dr. Stanley—I am health officer of the city of Sandusky, and came here for information, not to give it. I have not yet visited the schools of our city, though I will venture to say we have as fine looking buildings as there are in the State. Now, I wish to ask of the State Board of Health—suppose I visit these buildings and find them unfit, sanitarily, for occu-

pation as school buildings, and am able to point out the defects in some measure, what authority have I to say this thing must be remedied? If there is any such authority, I would like to know it.

Dr. Mullen—I am much pleased with the paper just read, but there is one point not yet touched upon in regard to the children, and that is in regard to the matter of allowing the children to run about out of doors during recess, whether the weather be pleasant or stormy. The children often come in from recess wet and cold, some of them with very dirty clothes, and stand close to the stove to dry and warm. The effluvium arising from their steaming garments renders the air of the room foul and unfit for the children to remain in. I have directed teachers, when they find a child in this condition to send him home until they can dry their garments, when they may be allowed to return.

Dr. Lewis—This is an important item in regard to the healthiness of school-houses. In regard to dry clothing, there are a great many children who have not two suits of clothing and can not change them. In my little town—and we pride ourselves on nothing—we have nice buildings, with large yards properly shaded, etc., and when they were built we made arrangements to burn coal, but now use gas. On visiting the basements recently, I found the walls reeking with slime and a mass of rubbish there, accumulated since we quit burning coal. Upon speaking of the matter to the superintendent, he said he had directed the janitor to clean it out, but he had failed to do it. Now, how can I have that matter attended to? By what means can I get a good hold, so as to be able to turn the screw and force them to remedy this evil? The same difficulty was experienced in attempting to have some old, dark curtains removed and suitable ones put in their place. They practically answer, upon protest, that they have been thinking about it, and would like to do it, but haven't much money and must economize; the hurting of the eyesight of one or two hundred pupils is nothing compared with the cost of a new set of curtains. Let us get to the practical side of sanitation. If there is any legislation on this matter I would like to know it.

President Hoover—I think there is a gentleman here who can throw some light on the questions asked, and I will take the liberty of extending the time to him a little, that he may answer fully. I will call upon Mr. Hunter, of Warren, who is an attorney-at-law.

Mr. Hunter—Mr. President, I sat down over here to one side that I might listen without taking part in the discussion. However, I don't know but what some of these questions do savor of the law, and will answer them to the best of my ability. But they all amount to the same thing, resolve themselves into one question, "How can I turn the screw?"

as Doctor Lewis has asked. Well, now, I don't profess to know every thing, but this seems to me a very clear proposition. These health officers ask, "How can I compel them to do this or that?" *You* have no right to compel them. You are not lawmakers. But you have in your city, or town or village a legislative body, or ought to have, a board of health who has the power to make laws governing these things, and when it makes the law you, or any private citizen can execute it. It is customary for the board of health to order you, or the sanitary policeman—who is a more fitting character to do it than you—to execute these orders. But if you have no sanitary policeman, or he does not attend to his duties, go and prepare an affidavit, sign it and take it to the mayor and let him issue a warrant on it for the arrest of the president of the board of education, or other proper person, for not attending to these things that should receive attention. Then, if he does not attend to it, let the fine be imposed on him. You need no more legislation than you have. The law backing up the boards of health is the most summary in the State. Let the board of health make its orders—standing orders for standing evils, and special orders for special evils. In case of violation of any order, let the offender be notified and given time for a hearing. If he still fails to remedy the evil file your affidavit, have him arrested and fined, and let him stand committed until the fine is paid.

Mr. Strong—Suppose in a case in a village, the criminal appeals to the county court, what would you do then?

Mr. Hunter—He can't appeal to the county court; he can only go there on error, by taking a bill of exceptions, in criminal cases. In civil cases the method is common to appeal the case by filing a bond of appeal.

Mr. Strong—I don't know that you understand me. We have a case in our town where the board of health brought a man before the mayor and he refused to answer there and took his case to the court of common pleas. Now, they are at loss what to do, for if it goes to a jury they are sure to acquit him.

Mr. Morris—We have had some trouble in Xenia. We had an ice pond inside the corporation, and there was a great deal of complaint about allowing ice to be put up from it, but could not get a board of health that was willing to abolish the nuisance. Finally, however, the board passed an order abolishing that pond. The parties that owned it put a dam up in the fall and we immediately ordered our sanitary policemen to tear down the dam. Then they got out an injunction to prevent the destruction of the dam, and the case was brought into the court of common pleas. The judge of this court decided that he had no control over decisions and orders of the board of health, and they immediately carried it to the district court, where the court decided it had no jurisdiction.

The parties were wealthy and took it to the supreme court where it was taken out of its order and tried immediately, and this court sustained the decision of the lower courts. That is where the screw comes. It cost us about fifty dollars, but there is not a man in Xenia now who questions the authority of the board of health, and I think this decision would apply to any other board of health.

Dr. Probst—I have had referred to me a case where the health officer made the proper affidavit and both the mayor and justice of the peace refused to issue a warrant for the arrest of the offender. What can be done, Mr. Hunter, in that case?

Mr. Hunter—Well, that is making an extreme case. I would say that he is a very mean mayor, and a very mean justice of the peace. The State expressly provided that a mayor may be impeached for failure to do his duty. Put him on trial.

Dr. Munson—The greatest trouble in the way of getting the orders of boards of health enforced, is the lack of a health officer who has sufficient stamina and backbone to discharge his duties without fear or favor. If the board makes its orders, (which have all the effect of ordinances) and has a good faithful health officer to see them enforced, there will be no trouble. As far as the sanitary condition of our schools is concerned, I am not able to say much. I have not visited them yet to examine their sanitary condition, as my colleagues have been men who paid very little attention to the duties of their office, and we have had few meetings and little done. But we have now a good board of five physicians, who have taken the work in hand in earnest, and after they appointed me health officer, I determined to see what could be done in the way of abating some much-complained of nuisances about town. After having one man arrested and brought before the mayor and fined, for failing to comply with orders given him through me, I have had no trouble in enforcing orders.

Dr. Sharp—It seems that our discussion has taken the broad roadway of general sanitary discussion, and has gotton off the subject of inspection of school-houses. But my sentiments are in accord with the gentleman who has just preceded me. I believe in having a health officer of sufficient backbone to discharge his duties faithfully. The laws of the board of health are to some extent advisory, and still mandatory, and I think the laws of the State are strong enough, to reach every case, and strong enough, I think, to take into the school-houses and abate any nuisances that may be found there. If I were a health officer and found the basement walls of a school reeking with slime, I should certainly call the attention of the board of education to the matter, and expect them to remedy it. If they failed to do it, would meet the case with the power of the board of health and compel them to attend to it. We are unfortunate in our town, Lon-

don, Ohio, in not having a health officer. We have a board of health which does, in cases of emergency, very good work, but they will not appoint a health officer. We have, however, an intelligent superintendent of schools, and all that is necessary is to call his attention to the remedying of evils that are found to exist, and through his influence with the board of education, it is usually accomplished without bringing into use the mandatory power of the board of health. In the matter of heating and ventilating, the board of health must co-operate with the board of education and ascertain the best methods for both, and thus endeavor to bring about the best results.

Dr. Reed—Just a word in regard to enforcing the law. In one instance where several teachers and scholars attended the funeral of a diphtheria patient, they were ordered to remain away from school for ten days, until I became satisfied that all danger of infection from them had passed, when they were allowed to return. That served to break up the attendance of teachers and scholars at such funerals. Our city solicitor has decided that the board of health has power to make orders which have the same power and effect as ordinances, and he also decided that we had power to levy fines in accordance with the law which establishes boards of health. The question is really on the constitutionality of delegating to one body the power given to another body, and possibly if brought to the supreme court, it would be decided that the city council has not the right to delegate its powers to the board of health.

Dr. Gray—It seems to me that I read a law somewhere, which said that the board of health has power to make rules and regulations, which, when approved by the council, shall have the full power and effect of municipal laws. In regard to school buildings, I think directors should be forced to employ intelligent janitors, and when a janitor is found to be careless in the care of the building, his discharge should follow.

The next paper read was:

WHAT MAY BOARDS OF HEALTH DO TO PREVENT TYPHOID FEVER?

By Dr. H. C. Houston, Health Officer, Urbana, Ohio.

The almost unlimited power invested in our health boards by the State would seem to render them able to crush out typhoid fever, if human agencies can accomplish such a result. In order to be prepared to prevent any given disease it is necessary to possess a knowledge of the causes of that disease. Impaired or lowered vitality renders a person or community more liable to be attacked by contagious or infectious diseases, and it is therefore the first great duty of health boards to abolish, as far as lies in their power, every thing likely to impair the general health of the community. To the health of the people certain things, we are all agreed, are essential, viz.:—pure air, pure water and wholesome food. Whatever, therefore, tends to deteriorate either of these important

factors of health should be abolished or corrected. Regarding the etiology of typhoid fever it is assumed that the disease may be propagated in two ways. 1st. From a pre-existing case. The bacillus or contagium is present in the fæces, and while not an active poison at the time of its passage, becomes so soon — its activity being increased by warmth and seclusion from air, the typhoid bacillus being reproduced during the course of the fever and escaping not by the breath, perspiration or urinary secretions, but by the fæces alone. 2d. The fever may be produced or generated anew by decomposing sewage and other forms of animal filth. There are of course predisposing causes, such as hunger, cold, watchings, despondency, anxiety, etc. Boards of health may, and should, therefore, see to it:

1st. That the water supply is pure and uncontaminated. Urbana has the Holly system of water—a deep well of pure water, remote from residences and privy vaults, supplies almost the entire population of the city.

Our board, for the past eight or nine years has carefully observed and studied the history of the few cases of typhoid fever that have occurred in our city, and in that time all the cases, so far as I am aware, have either developed in families whose water supply was obtained from wells, or else the disease had been contracted in other localities and patients brought to friends in Urbana. So impressed have we been by these facts that as a board we may possibly over-rate the importance of a pure water supply in the prevention of typhoid fever.

2d. Pure air. We should see that streets, alleys, water courses and private premises are clean. Hogs should not be allowed in corporate limits. Our sanitary police, at my request, took a census of the hogs in Urbana and reported nearly 1,000. These pens with the utmost care, can not be kept free from disagreeable odors and are, to some extent, doubtless, responsible for some of the disease in our midst. Privy vaults should be required to be cemented, and frequently cleaned. A system of sewerage maintained where it is possible, and gutters and alleys frequently flushed. Briefly, absolute cleanliness required on all private premises and on all public ways. If, notwithstanding all these precautious, typhoid fever makes its appearance, circulars or printed instructions should be furnished physicians, which they in turn should give their patrons requiring:

1st. Immediate disinfection and burial of discharges where they will not be liable to contaminate water used for drinking or culinary purposes.

2d. Prompt removal of bed cloths, carpets, etc., which may be soiled by discharges, and their prompt disinfection.

3d. Allowing no food or drink in the room except when in use.

4th. Calling attention to the predisposing causes, and admonishing nurses and friends to take due precaution regarding their health.

5th. Instructing attendants regarding the simplest and most effective means of disinfection.

Having carefully attended to all these matters, boards of health will have done all they can, so far as I am aware, to prevent typhoid fever.

DISCUSSION.

Dr. Stanley—In connection with this paper, I desire to ask whether houses wherein typhoid fever exists are placarded. I believe that it is exceedingly important that this should be done, though it is not done in our city.

Dr. Houston—We placard all houses where infectious diseases exist, in Urbana. While I do not consider typhoid fever contagious in the

ordinary sense of the word, yet I think it is well to keep persons out of the house where it exists.

Dr. Baldwin—I would like Dr. Houston to give us a list of the diseases for which houses are placarded.

Dr. Houston—In cases of typhoid fever, small-pox. scarlatina, measles, diphtheria and cholera.

Dr. Bishop—I would like to inquire if the author of this paper thinks hog pens or animal offal a cause of typhoid fever?

Dr. Houston—As I said, we have studied the subject of typhoid fever carefully, and the cases have generally occurred in the suburbs where the water supply is all obtained from surface wells, and it is here where most of the hogs are kept. To some extent this may be responsible for many cases.

Dr. Lewis—It has been my observation that typhoid fever assumes so many different forms and appears under such different circumstances, that, gray as I am, I am at a loss to account for its appearance sporadically. You may make the sanitary condition of your city as perfect as possible, you may remove every apparent nuisance, and the first thing you know you are called to the bedside of a typhoid fever patient. Where he got it you don't know; you may examine all the surroundings and find no indications of filth or improper drainage, or any thing of that kind. I have found in the country some of the most violent attacks of typhoid fever, and the most persistent. I have in my mind an instance where I was called in consulation in the country, where there was typhoid fever in three families in one immediate neighborhood, and seven persons died in these three farm houses. These were situated on as pretty a gravel ridge as there is in our country, with sugar trees growing on it; nice well water on the hill, and the barns and pens on sloping ground 100 feet below. The yards were nice and dry, and the cellars well ventilated; yet seven patients died right there in those three farm-houses inside of two weeks. It spread, and the next case was probably ten miles from there. It is a pretty thing to talk about preventing typhoid fever by perfect sanitation, but a difficlut thing to do; and my experience has led me to believe that we should do the best we can from a sanitary point of view, and leave the rest to nature and to Providence.

Mr. Dale—I think the Doctor is right in regard to its being almost impossible to trace the source of typhoid fever. In our little village, on a nice ridge of land a few rods from the creek, there was a family which has been greatly afflicted during the last few months with typhoid fever. One son died, one son was brought out of a long protracted illness, and the father is now lying very low with typhoid fever, and as yet the physicians have not traced it to any known cause.

Dr. Reed—The question of typhoid fever can not be discussed in three minutes, but from my experience the water that produces it contains organic matter. The thing to look for in chemical analysis is chlorine. Ordinary shallow wells that contain chlorine, you can rest assured contain organic matter. I believe in the germ theory, though by what means that germ is produced, I am unable to determine every time. I know it can be distributed by milk. I know of an out-break of typhoid fever among the customers of a milkman, who washed his milk cans in dirty water taken from near a dunghill. Of course, every person on that route was not affected by the poison to the same extent; but where the system is in condition to breed typhoid fever, and the germ is placed in the system, that person will have typhoid fever. Now, it is necessary to look after the milk supplies of our cities, and it is important that health officers should find out what kind of water is used to wash the milk cans.

In regard to testing water, no chemical test is worth much except to give you a clew as to the possibility of organic matter being present. Where upon test, a well is found freely charged with chlorine, that well should be condemned at once. In our city typhoid fever is exceptional, in fact, one year we did not have a case; another year we had one, and that was imported; and last year, not more than four, or six possibly. I know you can cut down typhoid fever by proper sanitation.

Dr. Whitmar—I would like to ask Dr. Lewis whether in the cases he mentioned, the three families had been using water out of one well.

Dr. Lewis—No; they used from three different wells, about a third of a mile apart, on the same ridge.

Dr. Whitmar—It has occurred to me that typhoid fever is not contagious, yet nearly every time can we trace it to the same ingestion, and nearly always find its source in a polluted well or stream. It has also been traced to the drinking of milk. We have case upon case where we can almost definitely trace the origin to the drinking water.

Dr. Gaskins—There is a ridge not far from Sabina where there is an epidemic of typhoid fever every time the season is dry. I have lived there for twenty-two years, and until the last three years we had little typhoid fever. During the last three years we have had from sixty to a hundred cases each year; but if you recollect, the last three years have been dry seasons, and the water in the wells all got low. The water in our section is mostly found at a depth of twenty-two feet, and though in ordinary seasons we have plenty of water, when it is dry the water gets low, and I think most of our typhoid fevers and other fevers can be traced to this low water. When the water gets low, a person gets more impurities in a given quantity of water than at other times.

Dr. Wagner—I think there is one very important factor of the disease that has been overlooked. I have been hunting around a little for this disease-producing agent, and watching the habits, not only of myself, but of others, and I find that a majority of us border closely on what might be called "gluttons." I think that nine out of ten eat more than they ought to eat. When these external agents are brought to bear on our over charged bodies they produce these various kinds of disease, while the same agencies brought to bear upon a man who eats nearer to the amount of food necessary for him to eat has no effect.

Professor Nelson—Those who know me know that I am interested in these questions from a scientific rather than a medical standpoint. I have recently had an opportunity of studying a case of typhoid fever, and think I have found out one or two things which answer the question asked a few moments ago. We have in our school at Delaware a young Japanese boy who has not been out of the city for two years. One day he came down with a clearly marked case of typhoid fever, one of those typical, sporadic cases. He had not been visited by any one out of the city, and there was no typhoid fever in the city at the time. As he was practically homeless and in want, I found him a room and took care of him. I began at once to talk to him about the possible source of contamination, and I found that he obtained water for drinking and cooking purposes—he supported himself—from a certain spring. I had the water analyzed by a chemist and no trace of contamination was found there, in fact, I expected to find none, as I knew the spring well. Not being yet satisfied, I pressed him more closely and discovered that about ten days before the outbreak he had taken water from a well across the street. I went over there and found that about two years before there had been in that family five or six cases of typhoid fever. I had no doubt traced that case home; he had obtained the poison from the well across the street. The family had become vaccinated, so to speak, with the poison; several had had the disease and the others had become accustomed to the water. But this young man went across the street and took his drink of the water, and the disease fastened itself upon him.

Dr. Miller, Massillon—I think we have, perhaps, pretty well settled that there is a germ characteristic of typhoid fever, though there may be some differences yet in regard to it, and in view of the fact that it is usually derived from ingesta, and perhaps more often from water than any thing else, there is very little danger of contagion; that is, that persons who simply come about the house should take it from contact. Of course, persons continually about the house, drinking the same water, or possibly eating in the room where there is danger of articles of food or drink being contaminated, might have the fever. But persons very rarely

take typhoid fever through the air. It is very difficult sometimes to run these cases down, and some very good men say that typhoid fever is "cess-pool" fever, because they are not able to trace it down. You find all grades of typhoid fever, from the old-fashioned, typical case that Professor Nelson spoke about, to the case that goes about the street, where the patient doesn't know he is sick. His is the "walking" case, as the doctors say. But there is an essential poison that produces typhoid and the board of health must look around and find this. The physician can not be depended upon to go to the bottom of these cases. He has his other cases to look after and has not the time. The suggestion might be made that the well might not be good and clean; the physician can not attend to the analyzing of this water, and perhaps condemning the well, and the State should attend to this, and not expect it to be done, and done thoroughly, by a health officer who gets fifty dollars a year. When the people are ready to pay a just and reasonable compensation for this work there will be no difficuly in hunting up these sources of trouble and stopping them, as is done in other things.

Dr. Sharp—Just a word in reference to this subject. I am of the opinion that most of the typhoid fever can be traced to ingesta, and as has been said to the drinking of water. Now, if we are agreed upon this, how can we prevent these cases of typhoid fever? Simply boil the water, boil all the water you drink, and if the water is the cause of the fever you will undoubtedly do away with your cases. Again, it has been asked of the gentleman who read the paper if he believed that the pig-pens had much to do with typhoid fever. I believe that all filth sources are hot-beds, as it were, for the active germination of the poison of typhoid fever, you may call it the *bacillus typhosus*, or you may call it the specific virus. They afford opportunity for the rapid development of that poison, and it may drain from these sources into our wells.

Now, in regard to what was said by the gentleman from Lancaster, it is not necessary that the wells should be on low ground, or in very close proximity to other wells, or in very close proximity to the source of poison. It has been found that the poison of typhoid fever will not be filtered out of water that has been drained through sand for over two hundred feet. The wells of a certain section may become contaminated from a single source by the water draining from one to the other; and when the water is low, as was said awhile ago, the poison is concentrated. Then, the plan by which to avoid typhoid fever is to do away with all filth sources and *boil the water*. Chlorine will not produce typhoid fever, but you find water largely impregnated with chlorine and you will find organic matter there. That water is of such a nature that it will rapidly develop typhoid fever poison, and you have it as a source of the fever.

Dr. Probst—The question is, what may boards of health do to prevent typhoid fever? My experience has been that boards of health in Ohio are doing little or nothing to prevent typhoid fever. In the first place, in most towns, physicians are not required to report these cases, though I believe this should be required. I think further, that when a case is reported, the health officer—who, perhaps, is not very well paid, but who labors out of love for humanity—should visit the house and endeavor to find the cause of the trouble. The board of health should exercise the right of closing wells in cases where the water is found to be contaminated; and where it is suspicioned that this may be the case, they should be condemned until an analysis of the water can be made. We all believe, perhaps, that the poison of typhoid fever is confined exclusively to the stools of the patient. It is plain, then, that if we can thoroughly disinfect the stools we may do away with any danger therefrom. The board of health should leave proper instructions for disinfection at the house where typhoid fever exists. This is done by the attending physician in some cases, but many of our physicians don't understand disinfection, frequently using something for that purpose which is not properly a disinfectant.

Dr. Mullen—In regard to the matter just referred to by our secretary, as to boards of health taking account of all cases of typhoid fever, I desire to ask some information. In a case where typhoid fever is said to exist from outside reports, but no report is made of it by the attending physician, is it the duty of the health officer to hunt the case up? We had such an instance in our town, where there were some half dozen cases of typhoid fever reported from outside sources, but the attending physicians, when inquired of in regard to the matter, denied that they had any such cases. That was the unanimous report of the physicians. In cases of this and similar reports of the existence of typhoid and other infectious diseases, where the attending physicans deny its existence, I do not feel it my duty to visit the houses personally to satisfy myself of the truth of their reports.

Mr. Whittington—I would like to ask the secretary what would be done in villages like ours, where the water is all derived from wells, if wells were ordered to be closed. We have no supply from reservoir or artesian well, and I would like to know what remedy could be suggested if these wells must be shut off?

Dr. Reed—I will answer that question, by saying, *boil the water.* That is a very cheap remedy, and it does not make much difference how much the water is contaminated; you kill the germ and drink it cooked.

The question of disinfecting stools of patients has been mentioned, but none have said what was the proper manner of disinfection. There

are, of course, many methods, but the cheapest and easiest is to simply pour scalding water over it as soon as the patient has used the vessel. It has been proved that scalding water will kill the germ, but freezing does not.

Dr. Probst—I have a paper on disinfectants to-night, and will not discuss that question now.

In regard to the wells, I will say that I was not counting on prohibiting the use of water from all the wells in your town, but was thinking of condemning a single well where it was found necessary. The board could condemn that well as a nuisance and compel the owner to get water from another source. I don't suppose that the board of health can put in water-works.

Dr. Sutton—I would like to ask Dr. Probst if he approves of placarding houses for typhoid fever?

Dr. Probst—I can see at least one good reason for so doing. If the trouble has originated in a polluted well, that well may be in large use, and the house should be placarded that others may be made aware of the danger. At least I would placard the well.

Dr. Gray—We have no water-works in our little village, and about two years ago we had two very malignant cases of typhoid fever, one of which died. Both used cistern water (they were living on the same lot), and there appeared to be no apparent cause for the trouble except that they had allowed the drainage from the sink to run into the gutter. This dish-water, etc., would run over the curb, leaving the sediment all along the place and making it very offensive. This state of affairs had existed for a long time, and there had been much complaint about it, but the health officer did not have much backbone and the evil was not remedied. I determined, however, to put a stop to it, and after serving the offenders with notices, in accordance with authority secured from the board of health, I finally succeeded in having the nuisance abated. They now run the kitchen slops into a sort of deep water closet. I would like to ask for information as to the best method of disposing of these kitchen slops in villages like ours. I have recommended the building of dry closets, cemented over the top and made air tight, and the board has approved this method. These of course would be emptied at intervals, and the contents carried away in wagons made for that purpose. I would like to ask also if the typhoid fever germ is not produced by the decomposition of vegetable matter?

Dr. Whitmar—If we should agree that the main source of typhoid fever is the water, nothing better could be recommended than to boil the water of all the wells in the neighborhood, during a period of epidemic, as they have done in a certain neighborhood of Tuscarawas county. In

this place nearly every family had typhoid fever year after year, until they took to the plan of boiling all water before using, and while they have not altogether rid themselves of the fever in this way, they have much reduced it.

Dr. Gray—I don't think any health officer ought to complain that he does not know what disinfectants to use, as the Secretary of the State Board of Health has furnished the local boards with a list of the proper disinfectants to use, and instructions for their use. And it seems to me that the best disinfectants to use are those which have been recommended by the board.

Dr. Collison—Our town is in somewhat the same condition as that represented by Dr. Gray. I have recommended the use of sewers where possible, but there are places in our town where they can not be used, and I would like to know what can be recommended in that case.

Dr. Probst—In answer to that question, I will call attention to Waring's method for the disposal of kitchen slops, which seems to be very effectual and easily applied. It consists simply of a tight barrel placed near the back door, with an overflow, connected with porous drain tile, the same being buried ten or twelve inches beneath the surface and running through the back yard. Thus the sewage is disposed of over the entire yard, and if grass seed is sown, a beautiful lawn may be made and all the organic matter will be taken up by the grass and utilized.

Dr. Miller—In the absence of sewers it is very hard to get rid of cess-pools. There are a great many lots in towns and cities which are too small to take care of the house waste by the Waring method. The question is, can the cess-pool be made safe? Some communities and some families must have cess-pools, and I think the water-tight cess-pools should be made, and proper precautions taken to avoid the entrance of the gasses into the house. The vault should be made of brick laid in cement, to prevent the contents from soaking into the ground and draining into wells, etc. We must have wells, and to keep them pure, you must shut up the cess-pools. The contents of these vaults must, of course, be pumped out at intervals and hauled away, and they must be properly ventilated. The proper traps must also be supplied between the vault and house opening.

Dr. Baldwin—What will you do with the contents of the cess-pool?

Mr. Whittington—In my experience I have found these sewers about the house a nuisance, for the vapor from them will get into the house, and cess-pools I don't believe in. The best method I can find for disposing of kitchen waste is the agricultural method. Take it and spread it upon the ground and then till the soil. If you only have six square feet, till

it with a spade and grow vegetables upon it, and let the vegetables eat up all this waste.

Dr. O'Ferrall—In spreading this kitchen waste upon the soil, you do not get rid of it. If it is not at your door, it is at somebody else's, and you will certainly have a nuisance. Neither do I think catch basins or cess-pools the proper thing. A good plan, I think, is to throw out these slops in one corner of the back yard, mixing with them wood or coal ashes, and occasionally sprinkling the pile with a solution of sulphate of iron to deodorize it. Then, when a sufficient pile has accumulated, it can be hauled away to a farm. The privy vault system could be conducted in the same manner, by the use of ashes and copperas water. I would like to ask whether ordinary lime water will destroy disease germs?

Dr. Gray—I do not see why, if the vault is made deep enough, and well cemented, with proper ventilation in the pipe leading to the house, it can not be made safe. Of course, if the cess-pool is not sealed, a nuisance is created right in the vault. If, as I believe, disease germs are formed by the decomposition of vegetable matter, and if these kitchen slops are put out in the yard and allowed to decompose there, disease germs will certainly be formed.

Dr. Reed—It seems to me that, from a sanitary standpoint, we run against a hard wall on the question of getting rid of house sewage in small towns where there is no sewerage system. There are many difficulties in the way. In the first place, the small towns must depend upon wells, and when you allow this material to percolate through the soil, you must have the soil so equally balanced with vegetation that the entire amount of waste will be taken up by it each day. This is next to impossible and you are bound to contaminate the water in that neighborhood, besides contaminating the soil itself and also contaminating the ground air. I move that the paper of Dr. Bell be taken up and read, as the question seems to have drifed that way.

The motion prevailed and the following paper was read by Secretary Probst:

THE COLLECTION AND DISPOSAL OF GARBAGE AND NIGHT SOIL IN VILLAGES AND SMALL TOWNS.

By Dr. William H. Bell, Health Officer, Clifton.

By the request of the Secretary of the State Board of Health to read a paper upon the above subject, with a view to invite discussion, this dissertation, therefore, shall be as brief as possible; merely giving you in a cursorily fashion, the pith of my gleanings from voluminous data consulted pertaining to this branch of sanitary science. By omitting the varying advantages and disadvantages, both natural and acquired of different localities, *i. e.*, drainage, soil, sub-soil, etc.; also the innumerable and various

schemes and devices, which from time to time have been suggested, I hope to court your patience, for were these to be discussed at length, much valuable time would be consumed, and the mission of this paper be lost.

Hoping that the above motives for brevity will be acceptable to all, we will proceed to consider the first half of our subject—the removal of garbage.

In dealing with this, it might be well to cite a practical demonstration; one of which I can speak with authority.

About a year ago the village of Clifton had this subject up for discussion; some plan for the removal of garbage was imperative, owing to her rapid growth, and with the approach of summer, some steps must be taken to rid her of this nuisance.

Solicited by the mayor, the board of health spent much time in considering the various methods proposed by sanitarians; at last it was deemed advisable to enter into contract with some one to remove the garbage at stated intervals; *i. e.*, commencing in May, it is removed four times a week, for six months; the balance of the year, twice a week.

In making out a list of the houses at which the garbage-man was to call, fully one-fourth declined his services, saying: "They had none to remove, as they burned it in their kitchen stoves."

From the above answer, the question readily presents itself:

Why could not the others do likewise? If the health officers could have the co-operation of all housewives in the endeavor to get rid of garbage, by the above plan, this perplexing problem would be solved; the great expenditure of money for the erection of costly furnaces, hauling, etc., would be saved.

The man with whom the village contracts, disposes of it by feeding to hogs. The above plan could be easily and readily applied to larger communities than a village, and no doubt would in proportion to the size of the place prove to be quite as convenient and economical.

The disposal of night soil has been the source of much argument and dispute. The methods proposed, experimented with, and adopted from time to time, have been numerous and their success as various as the plans proposed. What has proved beneficial in one locality has been an utter failure in another.

In all the towns and villages of this State will be found, to a certain extent, a total disregard for the first principles of this part of sanitation.

From the primitive wooden out-house with a hole dug in the ground to receive the excreta, to the more capacious vault, poorly constructed, lined with uncemented stone, a recepticle for the accumulation of filth, an abomination, more horrible than the first, which is allowed to ferment, emitting most noisome odors and dire disease. Not, perhaps, until the well is contaminated, the health of the family impaired, and life threatened, is one thought given to the warnings of past experience, and the doing away with this festering, polluting mass; then sanitary reform and aid is evoked.

We shall give an epitome of the pail system adopted by localities having no sewerage, and the latest project for disinfecting the output of sewers in towns so fortunate as to possess this means of getting rid of their filth from their houses.

The reform, when once inaugurated in village or town, should be of a uniform character, and the work in carrying it out methodically performed.

The pail system, when systematically carried out, will meet every requirement necessary for the establishment of a good healthy condition of the village. Economy should be studied in adopting this reform, when the privy accommodation is of the primitive type and the dwelling itself mean and dilapidated, for the expense of the erection of a model earth-closet would be unwarranted as all that is required is decency, which can be accomplished with trifling outlay; have the hole filled up and other alterations made so that a bucket or box may be placed beneath the seat to receive the excreta, which from time to time

should be covered with dry earth or sifted ashes, and when the box is full have it emptied into the garden, digging it into the soil.

The old-fashioned vault should also be filled up, but before proceeding to do so, it should be cleaned; if economy be advisable, the same changes may be made as in the previous case, but where the dwellings are situated adjoining one another and the garden space is contracted it would be unwise to empty the contents of the pail into the garden, and other provision will be required, *i. e.*, a pail wagon, which should call at the houses at certain intervals; when the services of such a wagon is required, the pails should be of a uniform pattern, and the wagon so constructed to carry them in an inoffensive manner to the village or town farm, where the pails are emptied, cleaned and then returned to the houses.

The problem for the disposition of filth collected by the pail system being so readily solved, we come to consider, "How shall we treat the accumulations of sewers, so that the streams may not be contaminated?"

In a brief review of W. Sante Crimp's late treatise on Sewage Disposal Works, I find that he refers to Mr. Webster's sewage treatment by electricity in the most sanguine manner, *i. e.*, "and the results are of the most encouraging nature;" he also says, "that when our towns will be lighted with electricity by night, whilst by day the dynamos will be employed in purifying the sewage, then the loading of the sewage with chemicals, with the consequent production of large masses of sludge, will no longer be necessary." The author is satisfied that the principle is correct; the difficulty lies in its application. But this difficulty can be overcome, and will be, as far greater ones have been in the modern history of science.

Mr. Webster after discussing "The oxidation of organic matter;" "Characteristics of town sewage;" "The action of iron salts;" "The effect of electrolysis and electrical action," describes the plant necessary for treating one million gallons of sewage flow in twenty-four hours; "the complete plant necessary is: Engine, dynamo and boiler house; two engines and boilers, each twelve-horse power nominal; two dynamos, brick shoots with culverts at sides; two settling tanks, sludge tanks, sewage culvert, treated sewage culvert, cast-iron plates, copper conductor, measuring instruments."

A channel should be kept at the bottom of the electrodes for the collection of the silt, with a culvert at side to flush it into, so as to prevent any block occurring.

The plates in each section are about an inch thick, and can be any length up to six feet. In each section the plates are parallel, and any one section is in series with the other, the arrangement being exactly like that of a series of primary battery cells. One advantage of having the plates in series is that, if any thing goes wrong in any particular section it can easily be set to right, the current being shut off during repairs.

The effluent produced by the above process contains about three grains per gallon of suspended matter, which consists almost entirely of oxide of iron which is quite innocuous. When this is objectionable, it can be removed by filtration through a few inches of sand. When an even higher degree of purification is required, for instance, when the effluent has to be run into a trout stream, it is possible to produce any further degree of purity required by passing it through an electric filter, which is arranged as follows: Alternate layers of small coke free from sulphur, are separated either by layers of sand or perforated tiles; by suitable connection these beds of coke form positive and negative electrodes, the first layer being sand so as to separate mechanically matters in suspension. It is impossible for disease germs to propagate owing to the nascent oxygen and chlorine produced when the filter is in action. The oxygen given off in the pores of the carbon also prevents the filter from choking.

Sir Henry Roscoe having investigated the above process, reports as follows:

"The quantity of sewage operated on in each experiment was about twenty thousand gallons.

"The reduction of organic matter in solution is the crucial test of the value of a precipitating agent, for unless the organic matter is reduced, the effluent will putrefy

and rapidly become offensive. I have not observed in any of the unfiltered effluents from this process which I have examined any signs of putrefaction, but on the contrary a tendency to oxidize.

"The absence of sulphureted hydrogen in samples of unfiltered effluents which have been kept in stoppered bottles for three weeks, is also a fact of importance.

"The settled sewage was not in this condition, as it rapidly underwent decomposition in two or three days, even when in contact with air.

"By this process the soluble organic matter is reduced to a condition favorable to the further precipitation by natural agencies."

DISCUSSION.

Mr. Dale—Our village has no sewerage system, but we have splendid water-works, which helps us out to some degree. We advocate and recommend the discontinuance of vaults and suggest having the slops from the house put in a proper place in the back yard, to be taken up and carried away in the early morning and evening with the night soil. It is taken away at a nominal price and compost made of it. The slops, we believe, do less harm when above ground, where they come in contact with the sun and air, than when flowing under ground. In the absence of a regular sewerage system, these things should be attended to at a very short range.

Upon motion, meeting adjourned until 7:30, standard time, same evening.

EVENING SESSION—JAN. 29, 1891.

President Hoover—The meeting will please come to order. Mr. Morris has a resolution to offer, and if agreeable to the Convention, we will give this gentleman an opportunity to offer the same now.

Mr. Morris—I desire to offer the following resolution:

Resolved, That the members of the State Board of Health be requested to urge the legislature to pass a law, extending the jurisdiction of the boards of health of villages and cities, one mile beyond their corporate limits, where this extension does not reach other counties and States.

The adoption of the resolution was moved and seconded.

Dr. Collamore—The law extends to police authorities of larger cities jurisdiction beyond the city limits; and if this power can be extended to the police, it surely can be extended to the boards of health. I know from experience that much trouble is caused by slaughter-houses and hog-pens situated just outside the city limits, and I think such a law would be a good thing.

President Hoover—If there are no further remarks I will put the question.

(Question put to vote and carried, adopting the resolution as read.)

President Hoover—The first paper on the program is:

THE HOG-PEN NUISANCE

By George P. Hunter, Esq., of Warren.

A hog-pen, like a barrel of whisky, harms no person if left alone. It is only when the hog enters, that either causes trouble. That being the case, most that I have to say will be about the hog in the pen. At the outset, I wish to say that I am not one of the number who condemn the growing of hogs, or the eating of pork. Scarcely a day passes by that I do not eat pork if I have confidence in the meat and the cooking. I believe that healthy pork, temperately used, is a delicious and safe food.

Having now spiked the guns of a class of critics, who would otherwise discount my position, by asserting that I was a hobbyist of some sort, I proceed to declare that the growing of hogs within or near cities, villages or hamlets should be peremptorily forbidden, and the inhibition should be enforced without fear or favor.

There are other subjects about which I have strong convictions with yet a lurking doubt. About the foregoing declaration I have not even a shadow of doubt or hesitation, and I make it after mature reflection, a careful canvass of all that can be said for and against it, and after the fullest opportunity to note the results, in the work of practical sanitation for a number of years.

From a Sanitary Code I read Standing Order, No. 39, as follows:

No. 39. "After January 1st, 1888, no person shall keep, or permit to be kept upon his premises, within the city of Warren, Ohio, any living animal of the hog kind, more than forty-eight hours."

Notice of the approach of such an order was given in September, 1887, so that all persons had ample opportunity to dispose of their hogs without undue loss; and upon said New Year day the new leaf was turned over, and we swore off. Most people had obeyed and the few were moving in that direction. For a time it seemed that that great sanitary measure would pass into operation without a jar, and such would have been the outcome, no doubt, had it not been for the approaching municipal elections. Every community is composed of about three classes. The first, and by far the largest class, are those who regard it a matter of high honor to obey the laws and respect the conscientious law maker. The second in order of numbers are those who mean to do right, but are easily excited and misled. There is the third class, made up of those who are ready to rebel at the slighest interference with personal interests or desires, and the viciously bad. To the latter class belong the professional demagogue, so by instinct, and so by practice. At this juncture of affairs the temptation to gain notoriety, or ride into office, was too great, and the pestiferous demagogue—a nuisance only a little less than the hog-pen and the hog, bestrode his championed beast, and started away at full tilt for some petty notoriety, or municipal office. It is just to say that not all who agitated were of of the genus demagogue, but it was he, as ever, who led off and set the ball rolling. The result was a great uproar. The standing orders enacted by the board of health were subsequently enacted into sanitary ordinances by the council. While it could hardly be expected that the seven men constituting the board of health and the six men constituting the council, after having carefully considered and enacted the law aforesaid, would, without a trial, at least, repeal or modify the same. yet a champion of the people presents a petition, signed by a minority of his section, asking to have their section exempted from the operation of the law. In other words, they ask to be permitted to secede. Then the contention broke out in the papers, and it is just to say that

moderate and able articles appeared in quick succession. One of these writings was by a very accomplished jurist, then and now upon the bench of the highest court of the State. The law withstood the petition and triumphed in the arena of public discussion and opinion. But one resort was left, and a combination was formed to test the law in the courts. A convenient martyr was found in the keeper of a suburban hotel. His place was out and his pen several hundred feet away from any populous section. The board was not aware of the purpose, and he talked on and off, but did nothing. After the board had exercised great leniency and had exhausted every argument and device to ward off the struggle, even to finding him buyers at extreme prices, an affidavit based upon the ordinances was filed, a warrant issued and the arrest made. The ordinances were so constructed as not to provide imprisonment for the primary penalty, that is, they provide for a fine, and to stand committed until fine and costs are paid. This gives no right to a jury or right of appeal, and leaves the issue in the hands of the mayor, as police judge. An able lawyer was employed and the first move was an attack upon the affidavit. It failed to charge that he kept a "*living* animal of the hog kind." The mayor exercised great fairness throughout the proceedings before him, and while it was doubtful whether the point was well taken, he discharged the prisoner. A new affidavit and arrest followed and then a protracted trial. It settled down to the real and only issue, viz.: did the ordinance exceed the necessities of the case to any or such an extent, as to appear a clear abuse of the police power. If it did, then the ordinance should be declared void; if not clearly an abuse of the police power it should be upheld and a conviction and fine follow, as there was designedly no dispute as to his keeping a living animal of the hog kind within the corporate territory.

Now, this thing we call the "police power," is not fully understood, even by lawyers and judges sometimes, and yet every law and ordinance enforcing social order rests upon it. It is summary in its operation, and in its reach, passes even the fundamental law of the State, as found in the Constitution. This statement will startle some of my legal brethren, but I refer them to an opinion delivered by the Supreme Court of the State, and reported in 39 O. St., 340. A statute exists imposing a uniform tax of one dollar upon every dog. Section 2, article 12 of the Constitution provides, "laws shall be passed, taxing by a uniform rule, all moneys, credits, etc.; and also all real and *personal property*, according to its true value in money." The defendant had four dogs and refused to pay the tax, because a dollar in every case was levied without regard to value, and hence the law was unconstitutional. One of the brightest minds ever upon the bench of the highest court of the State delivered the opinion and said:

"While the dog, as a species, possesses many valuable traits, which by some are denominated virtues, it is nevertheless known of all men, that he possesses vicious traits which are especially inimical to the important industry of raising sheep and wool. If the government were powerless to protect this industry from the ravages of dogs, it would indeed be important to protect its citizens in the enjoyment of property, than which none other is more essential to the public welfare. But such power is unquestionably vested in the general assembly as a police power, and, in the judgment of the general assembly, a *per capita* tax on dogs has been deemed a means of securing the necessary protection to sheep owners; and as the choice of means was within the power and discretion of the general assembly, its judgment is not subject to judicial control." So this law passed the constitutional provision, and was held good, because an exercise of the *police power*. In Kansas, a law forbids the making of malt liquors, and breweries costing great sums of money were rendered valueless. The Supreme Court of the United States held the law valid even against the constitutional provision that private property shall not be taken without due compensation, because the law was an exercise of the *police power* of the State to promote temperance. Mugler vs. State of Kansas. The highest court of California sustained an order of the health commission, forbidding the sale of milk from cows fed upon still-slop, as an exercise of the police power, and further held that the judgment of the commission as to the method adopted would not be reviewed. (43 Cal. 242). I regret that I have not at hand a citation to the Mugler case

but it is easily found. It is important to observe that it is no defense that there may be some other way, or even a better way, than the one chosen. "The *choice* of means was within the power and discretion of the general assembly, *its* judgment is not subject to judicial control." A reading of the case from which I have quoted, will disclose the fact that the justice and common pleas courts held against the law; and the district court did not dare to take the step taken by the supreme court, and so certified the case up without an opinion.

Ordinances excluding hogs have been sustained by the highest court of Massachusetts (97, Mass. 221), and the highest court of Iowa, (68 Iowa, 107). The case under review went against the defendant and he was fined $25 and costs. He took a bill of exceptions, setting out all the evidence and his exceptions, and was subsequently defeated in the common pleas, and again in the circuit court. By this time the costs were nearly $200, which he paid with his fine. So ended the hog nuisance. After three years, not only has the air cleared, but the public mind as well, and to reinstate a hog-pen would cause as great a storm as did Standing Order No. 39.

The judge of the circuit court delivering the opinion used this language:

"There was a great deal of testimony taken below before the mayor to show that the pig-pen is unwholesome and that it is offensive, and I think this is the experience of almost every person who has not lived in a pig-pen himself all his lifetime, that there is nothing much more offensive than a pig-pen, and nothing much more unwholesome; and it is one of those things it is impossible to make wholesome, or so it will not be offensive."

It is refreshing to read the opinions of courts, as in the case first cited and the case just quoted, wherein such eminent jurists grasp the situation and give the authorities without hesitation the full benefit of a clean cut and liberal judgment. Those who have occasion to journey through the courts in support of sanitary measures will now and then find upon the bench a narrow mind, or scheming politician, but more often, and especially in the higher courts, you will find broad and enlightened views, and a disposition to aid every effort to promote cleanliness and health.

So far I have given more attention to the remedy than the reason of the rule. Some of you may have to go through this very struggle, and it may be of service to you, and a fitting conclusion of this paper if I consider the necessities of the rule, and some of the arguments and devices which will surely be employed to defeat its enactment and execution. To keep the air above, and the earth and water below, pure and wholesome, is a good summary of the duties of the practical sanitarian. To that end every energy should be directed. The health boards have ample power. It is a most wise provision that mayors, who are the police judges in the smaller cities and villages, where health officers can not be employed to devote all their time to such matters, are members of, and ex-officio presidents of the health boards. Some of these mayors may and do think that to dispense the courtesies of the municipality and interest themselves in public improvements are more dignified and the greater duties of the office. I have to inform such gentlemen that they are laboring under a grave error. The duty of the mayor, transcendently above and beyond all others, is to guard the health, comfort and safety of the people. He should attend and preside over every meeting of the local board of health. He should reprove the laggard and report the delinquent for summary removal or discipline. He may practice modesty in presiding, but he should be a good listener, should catch the spirit and understand the reason of every order, and finally he should see to it that every order and regulation for cleanliness and health is executed to the letter. If he ignores the board, or fails to execute its orders, he should be impeached for neglect of his most important duties.

The observation of the judge delivering the opinion last quoted, is the universal experience of every person who has grown hogs. You may take the hog out, burn the old pen, carry the soil away, build a new pen on new ground, wash the hog in soap and water, place him into it with a towel and napkin and a code of rules, and in a month of

hot weather you will have another fully developed nuisance. In or near thickly settled communities the hog is always a nuisance. You can not love him a little and hate him a little. In other words, there is absolutely no middle ground between no hog or universal growing of hogs; no law or absolute prohibition.

Few can be found who will dispute the conclusion when applied to the denser parts of the community, but they contend that the suburbs be excepted. Then we have a community besieged on all sides by hog-pens, contaminating the air, earth and water. Our shallow wells, as a rule, are supplied with water which has fallen all about us, has been drawn into the earth by capillary attraction and the force of gravity, and carried down and off by the arteries below the frost line as permanent and well defined as the tubes of a sponge, and finally discharged into the well. Who can say where the waters of your well come from? What pens, privies or graveyards they drain? Many who hear me may not be interested in the expression of truths so well known to them, but I write for the ear of others not so favored, who thoughtlessly or ignorantly contend for an environment of hog-pens and filth, the breeding places of typhoid fever, sickness and death. But that is not all. When the sun shines brightly and the winds are at rest the gases from your environment of pens go straight up and may be harmless; but when the shades of night come on and the upper air becomes heavy and damp, the poisonous gases from a hundred hog-pens rise and mingle, and at the dead hour of night, when our windows are raised for fresh air, when the sense of smell and other sentinels which nature has given to guard us from such dangers are off duty, come those disease-laden gases, stealing along over the city, and settle down over the city like a death-pall, poisoning us at the very spring of health and vitality. Even that is not all. A hog grown in the country from pig-hood to hog-hood in an open field or orchard, with plenty of pure air to breathe, fresh earth in which to cleanse himself, and fruit and milk and a little corn to eat, and then quickly "hardened up" on corn, makes sweet meat and healthy food. But what shall be said of a town hog, which is kept all its life in a filthy pen, or at most, a yard, without a breath of air not contaminated, and fed always or chiefly on swill, usually sour, and often putrid? Can it be that the lungs and stomach, the very sources of blood and flesh, can be defiled without tainting the flesh? The answer can not be in doubt; and I believe it no kindness to permit such meat to be produced. Even more, I believe it is a crime to allow a poor man to feed such stuff for his little children and either kill them outright or prepare their little bodies to contract diseases which they should repel.

A common device resorted to is to petition that a ward or section be exempted, because the "people" want the hog. No better reply can be given than to quote from the paper of a distinguished judge: "The demand of one ward that its territory be exempt from the rule means disintegration and dissolution of the entire restriction. In asking that an ordinance, general in its character, shall not be of force in one ward, is a legal absurdity." No more absurd is it to ask the adoption of a system of permits. No man or body could withstand for a year the fault-finding, contention and uproar the conscientious administration of such a duty would occasion, and the result is always a refusal to all or granting to all, and if granted to any, contamination of earth and air to that extent must follow. Of all devices ever thought of, no one is more unjust in its operation, or more ineffectual to abate the real nuisance than the distance limit. The rich, who have large lots, and least need favor, can keep hogs under the distance rule, but the poor, who most need real favor, are prohibited. Moreover, there is no distance limit to air and water, and the real danger remains. Then I say again, there is absolutely no middle ground in this matter, and people who perpetuate this chief of all nuisances, and those whose duty it is to suppress it, and do not, should tremble when they hear of sickness and death from typhoid and other preventable diseases. Especially is this true of the mayors of municipalities. On first impression, some may have thought that I used too strong language when impeaching these chief officers for neglecting or

refusing to perform the most important duty imposed upon them by the laws and their oaths of office, but I have not a word to retract or an apology to offer. Whatever else may be said of the mayor of my city, he can not be reproached in this particular; but the same can not be said of many other magistrates whom I know, and all such should keep a book, and when a death occurs from a filth disease he should enter the name of the dead and along the line should write, "chargeable to my neglect." This is an awful arraignment, I know, but it is just, absolutely just. Since the banishment of the hog, January 1, 1888, and the emptying of the vaults, not a single death from typhoid fever, scarlet fever, diphtheria, or other like diseases has occurred within the city, except two deaths from diphtheria in a family just arrived from Pittsburg. Many have occurred just outside and in the country around, but not one here. Who says that cleanliness does not pay? Who wants the hog back? Who does not deem it an honor to belong to the board of health? Who is there now that does not sincerely praise the justice, patience and courage that caused reason to triumph over ignorance, selfishness and prejudice? Who does not take pride in the fact that a hog-pen nuisance can not be found in our borders?

President Hoover—The paper is before you for discusssion.

Dr. Conklin—I do not know whether the paper is open for discussion, because of the fact that it is all laid down from a point of law, and is so thoroughly discussed by the author.

Dr. Gray—May I ask, Mr. Hunter, what is the size of his town?

Mr. Hunter—About eight thousand inhabitants.

Dr. Gray—How long has it been since you have had a death from contagious disease?

Mr. Hunter—Since January 1, 1888—since the hogs went out.

Dr. T. Clark Miller—I don't think Mr. Hunter's idea is that the exportation of the hog wholly accounts for this exemption from disease, though no doubt it was an important element. But with such thorough administration in regard to the hog question, there is no doubt thorough sanitary management in other respects. If it were possible for the State Board of Health to enact a law to exclude hogs from villages, I think it would be a good thing to do.

President Hoover—I think the power lies with every municipality, and that it rests with them whether they want the hogs or not.

Dr. Houston—The principal difficulty in the way, is, I think, that there are very few councils who will enact such a law. Our council has been requested to do it, but politics enter largely into the matter, and it has not been done. As health officer one-half of my annoyance comes from hog-pens. Under the circumstances what can I do to control this evil? Complaints and suggestions that I ought to abate this nuisance are made to me, and I don't know how to do it, though I have tried various methods. I have kept a record of those who kept hogs and required the pens to be cleaned and the offal buried, but even this can not be enforced satisfactorily.

President Hoover—If I correctly understand Mr. Hunter, it does not require an ordinance to be passed by the council, but a rule to be made by the board of health for abolishing the keeping of hogs within the corporation.

Mr. Hunter—Well, that is a statement I would make with caution. It has been remarked to-day that there is a question in some people's minds as to how far the board of health can order, but I am inclined to believe, though I will not say it with the utmost positiveness, that if the local board of health will take the proper course in enacting its orders, it can obviate the entire difficulty. It is a great mistake for the health officer to try to do this. The health officer can't order any thing, until it is so ordered by the board of health. The board should formulate its standing orders carefully, so they will "hold water," as the lawyers say, and then enact them with all the formality that the council uses in the passage of an ordinance. The law requires council to read the proposed ordinance three times and then publish the same for a certain length of time in a weekly and daily paper. If the board of health will enact its orders with this same formality, you can beg council "good day" and go right on in the work.

Some gentlemen here spoke about physicians not reporting infectious diseases. You need not have any trouble about that, for the State of Ohio says that it must be done. In many other cases, you will find on examination, that the legislature has done the whole work for you. Now, the legislature has provided that physicians must report every case of infectious or contagious disease within twenty-four hours after its discovery, and if a physician fails to do this, arrest him. You will not have to do it more than once, when he will take the hint and do as the law requires. Commence with section 2113 of the Revised Statutes and read right along, and you will find many things in connection with this subject that you never thought of. The State Board of Health would not have the power to make a sweeping order of that kind for the State, but the legislature would, and I think the legislature ought to do it for every city and village.

Our board of health made seventy-five standing orders, applying not only to common cases, but to cases of epidemics, etc., so that we are always prepared. Then the city council took them and prepared an ordinance with seventy-five sections corresponding to these orders. Of couse, they had to provide penalties, but we did not. If imprisonment is provided as the primary penalty, then the offender has a right to a jury trial, but if imprisonment is not the primary penalty, but a fine is provided, then, under the laws of the State, he has no right to a jury and no right to appeal.

Dr. Bishop—I would like to inquire, where physicians fail to report cases of contagious disease, on the ground that it is unconstitutional to perform services without compensation, is there a way to force them to do it?

Mr. Hunter—How can you make a man go out and work two days on the highway without compensation? How can you fine a man who refuses to act as constable or supervisor? By the statutes, which provides that they shall do this work for nothing. This police power is a good, big thing, and there are a great many things a man must do for the good of the community. The physician must do it, compensation or no compensation.

President Hoover—Doubtless this discussion is very interesting, and we would like to hear Mr. Hunter talk longer. He has been catechised and asked all sorts of questions, which he has answered, and all this has consumed considerable time. It will now be necessary to pass to the next number on the program, a paper on "The Use and Abuse of Disinfectants," by the Secretary of the Board.

Thereupon the following paper was read:

THE USE AND ABUSE OF DISINFECTANTS.

By Dr C. O. Probst, Secretary State Board of Health, Columbus.

The use of disinfectants for the prevention of infectious diseases has been practiced from the earliest times, especially the most certain of all disinfectants—fire. Many chemical agents were also used for this purpose centuries before the "germ theory" of the cause of such diseases was known or thought of. In most part the latter were without effect, and were selected chiefly for their odoriferous properties, a stink being considered in some way to be obnoxious to pestilential diseases. This belief has come down to the present time, and the popular idea of a disinfectant is something with a bad smell.

You would hardly expect to find among the medical profession at the close of the nineteenth century, faith in the prophylactic virtues of garlic and asafœtida, yet witness the following clipped from a medical journal in regard to a certain town in Ohio:

A town in Ohio is at present suffering an epidemic of diphtheria, but the town has a board of health that is fully awake to its responsibilities as a prophylactic power, and it addresses a circular letter of instructions to the citizens, from which we take the following: "Second, we recommend that every child wear next its person, and suspended by tape from the neck, a little sack made of open materials, containing equal portions of gum camphor, gum asafœtida and carbonate of ammonia. Also, that onions be freely used as an article of diet, and the children be required to partake freely thereof, at least once a day. That a small portion of flour of sulphur be given every third evening upon retiring; and that on the first symptoms of sore throat a physician be called." Probably the intention of these measures is to make each child so aromatically offensive that no disease germ of any sensibility whatever can be tempted to take up its habitation in such a malodorous locality. With this end in view the precautions are well taken: asafœtida and ammonia can certainly guard the cutaneous surface, the fumes arising from a daily use of onions will effectually bar admission by the air passages, and any enterprising germ who attempts to gain a foothold in the citadel by the rear

entrance will encounter the stifling effects of a sulphur diet, and wish he hadn't tried it. The sensible suggestion which closes the above quotation redeems it from utter absurdity.

These instructions, as I was informed by the health officer, were founded on the advice of a physician.

It is only within comparatively recent times that a scientific use of disinfectants has been made possible. As experimental biology aided by the microscope revealed nature's secrets as to the cause of many diseases, and it was learned that man, who preys upon the animal and vegetable kingdoms for sustenance, is himself a prey to innumerable organisms among the infinitely little, students of preventive medicine eagerly seized these results and applied them to the destruction of disease agencies. Disinfection is based on the germ theory, and it can no longer be questioned that germs or their products are the cause of many diseases. In the use of disinfectants an important difference in the manner of germ multiplication should be noted. Some varieties are reproduced by fission or simple division of the parent germ, while others multiply by the formation of spores, which are akin to seeds. Germs of the first class are easily destroyed, as are also the adult germs of the second class; but the spores of the latter offer a great resistance to all destructive agencies, and a disinfectant which is highly efficient in dealing with diseases depending on germs which do not form spores, may be inert in preventing germ diseases attended with spore formation.

Unfortunately, we are not yet able to state positively which germs do or do not multiply by sporification, and consequently the only safe rule is to use, whenever possible, only such disinfectants as are known to be capable of destroying spores.

It will not be possible within the limits of this paper to discuss the whole subject of disinfection, and I will confine my remarks to the use of the more important disinfectants, and the abuses common in their application.

Heat is one of the most certain agents for the destruction of infectious material—that is, material containing the germs of infectious diseases. In diphtheria there is no better way of disinfecting or destroying the infectious secretions from the throat and nose, than by having them received on old cloths and immediately burned in a hot fire. Burning is also a safe and ready means for disposing of infected bedding, clothing, etc., not too valuable to destroy.

Boiling, when prolonged, will also destroy all known germs and their spores, but some precautions are necessary. We must be absolutely certain that each article is completely immersed in the boiling water, and when soiled with infectious discharges, it must be done before these become dried. Stained clothing placed in boiling water will remain indelibly stained, and when these are valuable it is better to first rinse them in a disinfectant solution.

When large quantities of textile fabrics are to be disinfected, it can often be most conveniently done by arranging a tight box and admitting live steam under pressure to about twenty-five pounds.

Of the chemical disinfectants, but two are worthy of much consideration; these are corrosive sublimate and chloride of lime. In solutions of proper strength these agents destroy all known germs and their spores, and they should be used in preference to all others.

In using solutions of the bi-chloride of mercury care should be taken to have them of sufficient strength. Koch claims that a solution of 1 to 1,000 (one drachm to the gallon) will destroy all germs and their spores, but Sternberg recommends that it should not be less than 1 to 500, especially where the infectious material is of a solid or semi-solid consistency.

In solutions of 1 to 1,000 the bi-chloride may safely be depended upon for disinfecting clothing and similar articles, and for washing surfaces of floors, walls, etc.

The element of time, and the proportion of the quantity of material to be disinfected to the quantity of bi-chloride used must always be taken into consideration. For

disinfecting fluid discharges or other fluid material, not less than two hours' time should be allowed, and the quantity of bi-chloride solution should equal the quantity of infectious material, and be used in strength not less than two drachms to the gallon. When solid or semi-solid masses are to be disinfected with the bi-chloride, it will be necessary to break these down and mix them thoroughly with the solution, for when the germs to be destroyed are imbedded in masses of albuminoid material, the bi-chloride, by combining with and coagulating the albumen of the outer surface, will form a protective coating which may leave germs in the interior active to again manifest pathogenic properties when set free. For this reason, when formed stools, fresh tuberculous sputum, or other solid or semi-solid albuminous material is to be disinfected, it is much safer to use an oxydizing agent which will destroy both germs and the material in which they are found. Of the disinfectants of this class, none are so good as fresh chloride of lime. It is more rapid in its action than the bi-chloride, being effective in thirty minutes, while the other, as was stated, requires not less than two hours. In using the chloride of lime we should be sure that we have a fresh article, having a strong smell of chlorine, and it must be used in sufficient amount, and in solutions not too dilute.

This agent owes its activity to the available chlorine it contains, the chlorine oxydizing the organic matter with which it comes in contact. In the use of disinfectants of this class we should never lose sight of the fact that they themselves are destroyed in the reaction to which their disinfecting power is due, and unless they are used in excess of the organic matter to be disinfected, undestroyed masses of organic matter will be left containing germs retaining their full power for evil, and complete failure to disinfect will result.

For disinfecting feces chloride of lime is usually used in solution containing four ounces in one gallon of water. Not less than one quart of this solution should be used for each two ounces of feces to be disinfected. But as this would require one gallon of the solution for an alvine evacuation of eight ounces, and as it would often be inconvenient to use this amount of the solution, it will be better to double the strength, using eight ounces to the gallon.

For disinfecting clothing, bedding, etc., a solution containing one and a half to two ounces to the gallon is effective.

Another disinfectant which has been used from remote times, and is now used oftener than any other, is sulphur di-oxide, formed by burning sulphur in the presence of oxygen. The use of this agent as a disinfectant has led to a long continued and not yet settled controversy. Experiments have proven beyond doubt that sulphur fumes will not destroy the infectious properties of material containing spores. This is the conclusion of Koch, Sternberg and Wolffhuegel, and the latter thinks its use should be abandoned. Sternberg, however, has shown that it does destroy the specific infecting power of vaccine virus dried upon ivory points, and other observers have proved that germs that do not produce spores are readily killed in an atmosphere charged with this gas. The experience of thousands of health officers and physicians seems to prove its effectiveness in destroying the specific cause of small-pox, scarlet fever and diphtheria, and as not one of these diseases is known to depend on a spore producing germ, there is not sufficient reason, I think, for discarding this most easily applied of all disinfectants. Dr. Edson, health officer of New York City, and Dr. Durgin, health officer of Boston, in discussing this question at the Brooklyn meeting of the American Public Health Association, testified to the practical results in preventing the spread of small-pox with sulphur fumigation, and reported that in thousands of instances where it had been used for this purpose under their observation, no case of small-pox had ever been traceable to articles or houses so disinfected.

Most authorities are agreed that the presence of moisture adds greatly to the disinfecting properties of sulphur fumes, the di-oxide, by uniting with water, being converted into sulphurous acid, a more powerful disinfectant.

As to the abuse of disinfectants—many abuses have necessarily been mentioned in treating of their use.

A most common abuse among both the profession and laity is in using antiseptics where disinfectants should be, and are intended to be used. Copperas is, perhaps, used oftener than any other agent for the disinfection of the stools of typhoid fever. Facts were collected by the State Board from about 100 physicians in active practice in regard to 225 cases of typhoid fever. Of the disinfectants used, thirty used copperas, twenty-two carbolic acid, nineteen chloride of lime, seventeen corrosive sublimate, ten chloride of zinc, five burning, four lime, three sulphate of copper, and one Platt's chlorides. Most of these agents are not disinfectants. Copperas in any strength will not destroy the germs of disease nor their spores. It prevents decomposition by checking the action of germ life, but does not prevent their action when they are transferred to fresh soil.

Carbolic acid is another agent in which too much confidence has been placed as a disinfectant. Notter states that a six per cent. solution did not destroy the movements of bacteria in a putrid infusion of beef, even after the lapse of seven days.

Many other disinfectants are in use and could be relied upon in the absence of those recommended, but the cheapness, certainty and easy applicability of the corrosive sublimate and chloride of lime solutions leave no excuse for employing any whose action is at all uncertain.

A word should be said in regard to the endless list of so-called disinfectants placed on the market.

The majority of these are either simply deodorizers or antiseptics, useless for disinfection. It is not supposed that health officers will use them, but I would suggest that all of us should take every occasion to instruct the public of their true value. Some of these preparations claim the property of disinfecting an occupied room by having a special affinity for disease germs, and, I am sorry to say, these claims have been bolstered up by physicians and health officers certifying to have successfully used them for this purpose.

There is little uncertainty in regard to the action of disinfectants, and but little doubt that the proper application of disinfection to the prevention of infectious diseases would vastly decrease their prevalence.

As a rule, the application of disinfectants is not made by local boards of health, the attending physicians or the heads of families being expected to carry out the proper measures. The average layman is not capable, without the most minute instructions, of using disinfectants in the required manner, and physicians should not be called on to do this work where a board of health is in existence. I refer now to the disinfection that should always follow the death or recovery of a case of infectious disease. The common practice with boards of health, when a case of infectious disease is reported, is to placard the house, and keep the children from school until the case has terminated. The responsibility of the board of health should not terminate there, but in all cases proper measures of disinfection should be carried out by an agent of the board of health, or at least under his personal supervision.

The State Board has endeavored to instruct the people in the prevention of infectious diseases, including the use of disinfectants, and pamphlets relating to this subject have been sent throughout the State. It is a lamentable fact, however, that the great mass of the people are still too ignorant or too careless to carry out the proper measures for disinfection, and in conclusion, I wish to enforce the observation already made, viz.: That as far as possible the use of disinfectants should be in the hands of boards of health.

President Hoover—The next paper will be

THE EVOLUTION OF A BOARD OF HEALTH.

By Dr. T. Clarke Miller, Health Officer, Massillon.

I have chosen for the subject of a few remarks the "Evolution of a Board of Health."

A discussion of this subject calls for a consideration of the tendencies within the board as legally constituted, to grow in the direction of an efficient performance of its functions as the guardian of the public health—an agency apt to conserve the public health and prevent avoidable disease.

The idea sought to be conveyed by the phrase "conserversation of health" is not exactly that expressed by prevention of disease, because there are degrees of unhealth which seriously interfere with the efficiency of individuals and classes, but do not bring them to see the necessity of employing curative agencies. They are not sick, they are simply not well.

Perhaps two-thirds of the people who are to-day doing the world's work, in all departments, are measurably disabled by a physical state which is not sickness, but which is more or less removed from health. An interest in these and kindred facts is a prerequisite in the make-up of a good member of a board of health, and it is possible that city councils do not always happen to appoint members having this prime qualification to serve on the board of health.

If the appointee should have some knowledge of the present state of sanitary science and practice, it would constitute a very great addition to his qualifications. Such considerations are, no doubt, often ignored by councils in the election of members.

It is legitimate to believe that physicians are, as a class better qualified for such positions than other people, though the dense ignorance of sanitary matters displayed by a considerable percentage of the medical practitioners is astounding, yet they average better, in this regard, than others, even among intelligent people. Yet we have seen, within a year, an honorable legislator, from a motive that must have been petty, introducing a bill limiting the eligibility of physicians to membership on boards of health. This outrageous and unconstitutional bill, to deprive physicians of their rights as citizens by reason of their occupation, and, in spite of their more eminent qualifications, was enacted into so-called law by an eternally vigilant and liberty-loving legislature, and so far I have heard no protest from the outraged citizens who are so unfortunate as to suppose that they are engaged in an honorable and legitimate calling.

After having prescribed that the men appointed to membership on the board of health should have some interest in sanitary matters, though they might be destitute of knowledge, we may consider the influences that will be brought to bear on individual members and on the board—"the environments." In spite of all opposition to the creation of a board, and all political and personal antagonisms to individual candidates for membership, and the reluctance of a council to bring into existence an organization which is not or need not be altogether pliant to its dictation, we will assume that the board has been appointed.

The mayor, who is, *ex-officio*, the president of the board, can have a very potent influence for good or evil, if he has taken the trouble to familiarize himself with statutes, in so far as they relate to the powers, duties and limitations of a board of health, and is in sympathy with its objects, he can greatly assist in placing it on a good working basis. It is likely, however, that his knowledge is intuitive, and that the preliminary work of the board will have to be done in spite of him. Whereas, it is his duty and privilege to aid very greatly by his advice and co-operation.

If the people take a friendly interest in the board and its work, it is hardly possible that it should fail. The people, however, will usually take an *un*friendly interest, looking upon a board of health, as an unnecessary and expensive addition to the municipal machinery. These hostiles will not always be the ignorant part of the population, but the selfish, wise people who are sure they know how to take care of themselves, and do not care what becomes of those who do not know how or are not able. Admitted ignorance is hopeful ground, compared with intelligent self-sufficiency, in which to sow the seeds of sanitary knowledge.

Having composed a board of health of the right kind of material in other respects, it should, in addition, be amply endowed with conservative common sense.

Under the statutes of Ohio, boards of health are clothed with great power, but if this power is asserted hastily and severely, the board will not get the sympathy and co-operation of the people. If the people make up their minds to antagonize a board, it will be very long before such board will develop into the potent agent for the people's good, which it ought to be.

No effort must be spared to commend the board and its work to the judgment of the people; they will sustain severe measures when it appears that they are only resorted to for the good of the people.

We occasionally see evidence, in high places, of impatience that a newly organized board of health does not, at once, enter upon the thorough, methodic and effective work in all directions of an old board which has established itself in the confidence and approval of the people. Every health officer who has not merely entered upon the labor of other men, knows how hard it is to make a board thoroughly efficient—how many months and even years it takes to get the members of a board imbued with a proper appreciation of their relations to the people, and this is not very strange when we consider that once a year the political wheel or some other malign agency will rotate two members out of office and fill their places with raw material. After all, the health officer is the essential feature of the board. A board which has a good health officer and sustains him is a good board.

There is likely to be a prejudice that any physician is competent to do effective work as a health officer, and even that any person, "not an idiot," nor "an Indian not taxed," is qualified to fill this office. Unfortunately many physicians have not taken the pains necessary to familiarize themselves with the questions of hygiene and sanitation, yet a better selection can be made from among physicians than from any other class of citizens.

The tenure of the health officer is even more precarious than that of the members. No organization can become a real board of health so long as it is disposed to change health officers every year. When fairly good men have been placed on the board of health they should be kept there as long as they are able and willing to serve; and when a fairly good man has been selected as health officer he should be kept there, for his value as an officer becomes greater every year. The compensation should be such as to warrant the health officer in giving special time and study to his work, and to foster in him an ambition to be at least a regular soldier in the sanitary army, if not in the front rank or among the authorities. There is no municipal expenditure that is so sure to accomplish more than it costs as a competent health officer and a good board of health.

It is to be hoped that the medical colleges, now that they are extending the requirements as to time of study, will begin to give thorough and systematic courses on sanitary science and practice. It ought to be a discredit to a physician and his alma mater if he is not well informed on these lines. Every physician should be reasonably well qualified for the work of a health officer, as far as professional knowledge goes. He can then, easily, familiarize himself with the laws of the State and thus be able to inform the board as to its powers and duties under the law.

A newly organized board of health can best, perhaps, begin its work by a systematic inspection of streets and alleys, and as the necessities appear secure the enactment,

by the council, of such ordinances as may be necessary to insure their maintenance in a decent and safe condition. It is best not to depend on the power given to the board by the council and the statutes to make such orders as it may deem necessary, but to have these orders, or at least the basis for them, pass through the legislative department of the city government, so that, as far as possible, prosecutions may be for the violation of a definite ordinance, avoiding the necessity of convincing twelve "good and true" men that the public safety was endangered by any means, act or neglect.

Inspections should next be extended to manufacturing establishments and residence property, stables, privies, pig-pens, etc., and ordinances secured regulating the keeping of animals in the city, the location and management of privies, etc.

The board should secure the passage of an ordinance requiring physicians to report contagious diseases to the health officer and forbidding families affected by such diseases to attend the schools; boards of education usually have rules to this effect, and on this line of work the board will have the co-operation of the school authorities and teachers.

Ordinances should be passed making it the duty of physicians, mid-wives, undertakers and sextons to report all births and deaths coming to their professional or official knowledge, and regulating all matters pertaining to the disposal of the dead; also regulating slaughter-houses, sewers, house drainage, the disposal of dead animals, offal, etc.

Time and care must not be spared in constructing ordinances having a bearing on the work of the board of health, in order that these ordinances may be clear and definite in their provisions and readily adaptable to any probable case.

My main object in opening up this line of discussion is to correct an impression in the minds of a great many good people, to the effect that an efficient board of health springs fully armed and equipped from the brain of the city council; it never does. Two considerations will determine the efficiency of a board, viz.: The quality of its elements and its environment.

President Hoover—The next paper is:

DOES SANITATION PAY?

By Edward T. Nelson, M. A., Ph. D., Member State Board of Health, Delaware.

Events impress us inversely as their distance, and directly as their novelty. We read of an earthquake in Venezuela, a river inundation in China, and a pilgrimage to Mecca, each accompanied with a most lamentable loss of life; and yet, on being asked ten minutes afterward, "What is the news in the morning paper?" we reply, "Nothing startling, except an account of a prize-fight at New Orleans, in which Bob Fitzsimmons whipped Jack Dempsey." The other events are removed from us by so great a distance, and concern countries in which we have so slight a personal interest, that they fail to awaken in us any profound sympathy. The burning of a dwelling in our own town, an accident on our local railway, or a cyclone in a neighboring county affects us for a time far more than the greatest events of history or the grandest discoveries of science. So, also, a single death by accident makes a far greater impression upon us than do a hundred deaths from natural causes. Contrast your feelings on hearing that one hundred and twenty-five men lost their lives at Mammoth Mines, Pennsylvania, by an explosion of fire-damp, with those you experienced on reading, that of the forty-three thousand pilgrims who went by steamer to Mecca during the season of 1890, fully fifteen thousand died along the route. We are entirely surrounded by conditions that have lost their true import and influence through long familiarity. The saloon would not be tolerated in any American city for forty-eight hours if it were to come to us to-day as a new institution, and if we were permitted to witness all of its operations and effects for that short time. But we have grown up with it. It has always been a factor in our environ-

ment. For this reason it is permitted to exist. Nor would an annual typhoid fever mortality of forty thousand be tolerated by the people of the United States if they were not constantly meeting with the disease.

Death losses in war make a far stronger impression upon us than do death losses in peace. Twenty-five years ago Grant fought in the Wilderness and Sherman marched to the sea, but the people of the United States are still living in those days of war. They still see the marching soldiers, hear the rattle of the musketry and the boom of the cannon, mournfully count the long rows of silent graves in the national cemeteries, and the face of the whole nation grows pale as it thus estimates the slaughter of war and what it cost us to have a nation, and yet more people die each year in the single city of New York, from diseases which are clearly and positively preventable than were lost to the country during any one year of the great sectional conflict of 1861. We shudder at the thought of war and its train of horrors, but not even a passing interest can be awakened in the ever increasing death-rolls of our large cities. Our newspapers are filled with words of praise for General Miles, who seems to have brought the present Indian war to a most successful and peaceful termination, and one of our largest cities rises to do him honor at a festal banquet. We join in the glad acclaim, while remembering that more people die in these United States every year from diseases which are clearly and positively preventable, than have been lost to the nation by all the wars in its history. The praises of the sanitarian are not sung by an exultant populace, neither is his brow crowned with laurel. For some unexplained reason all of our text books in history are text books of war. They are filled with accounts of conflicts and victories, of marches and retreats, of deeds of personal daring and sacrifice, but the infinitely more important subjects of health and disease, of the onward march of epidemics, of professional victories, of the deeds of daring and sacrifice of those who are giving their health, their time, their lives, to suffering humanity—these subjects are not even mentioned by name. As in history, so with the daily newspaper. Less space is devoted to reporting the proceedings of a sanitary convention than to a cocking main.

It is very evident that sanitation does not pay the sanitarian. It brings to him to-day neither wealth nor honor. Nowhere is he paid a living salary; nowhere clothed with such authority as to give him a high standing in the community. He is tolerated simply because he has the law on his side. Too often town councils plot his destruction, and by withholding necessary appropriations, accomplish by indirection what they are forbidden to do by law. Thus apathy, if not indeed open opposition, on the part of other officials, thwarts his plans and destroys his entire usefulness. A few weeks ago the writer spent an evening in the company of a number of the most prominent school men in one of our Western States. Among other topics, they discussed with the greatest freedom the relation of boards of education to boards of health, and especially the relation of superintendent of schools to the health officer. One speaker called attention to the unreasonableness of many of the demands made by the boards of health. He would not enforce them because he did not believe in them. A second speaker asserted that he had forbidden the health officer to come upon the school grounds or into the school buildings. If such opposition is to be met with in our most highly educated class what may we not expect in the slums and from the dregs of society? I no longer wonder at our failures. I only marvel that any success has crowned our labors.

It has seemed to me that we are in part to blame for the existing conditions. Health officers come to the execution of duties for which they have made no special preparation. Their terms of office are so uncertain and their compensation so inadequate that they have neither means, nor opportunity, nor inducement to prosecute studies in the field of public health. For the most part they are physicians in active practice, who look upon the work as at once a duty and a burden, or else physicians in retirement, who find relief from *ennui* by accepting the simple labors which a health office is supposed to impose, and they devote to this work one or more hours daily which otherwise would hang heavily upon their hands. It is quite otherwise to day in England. The

office calls for special preparation and rewards the officer with larger emoluments, a more perfect tenure, far greater authority and more substantial recognition. Health officers must be graduated from some school of hygiene, and these "fountains of health" are springing up all over the kingdom. Candidates for positions in the health department are examined upon the studies of a prescribed course, not the least important part being a critical examination of all the laws of the Crown bearing upon the subject of health. They become experts in plumbing, ventilation and drainage, and no less so in the diagnosis of disease, in nursing and in midwifery. In short, they are educated officers of health and not policemen of smells. In sanitation as in temperance, the laws are ample for our complete protection, but through ignorance we do not employ or enforce them.

There is, however, a reward for the health officer, even in this country. His pay does not come from the treasury of the city, or State, nor from the plaudits of the people, but from an approving conscience. He is engaged single-handed in a silent reformation—but one no less potent because silent. He believes that disease and death are not only too prevalent, but they are largely due to removable causes. He labors in hope and is permitted to witness a marked fall in the death rate as a direct result of his labors. Seeing the close connection between sanitation and a lower death rate, he has little patience with that ultra-religious, even fatalistic doctrine, so often repeated in his hearing, that Providence sends disease upon the innocent, though most unfortunate sufferer. One of the most prominent writers in our country said in a recent address, "That while it is not yet possible to determine which eighteen will die, nevertheless it is as certain as sunshine or the law which holds sun and moon in their orbits that eighteen persons out of every thousand must die annually." There is fatalism for you and of the very rankest kind. Eighteen persons out of every thousand must die annually. It is very difficult to see why the number must be just eighteen. *Thirteen* has generally been considered a more fatal number. Why do health boards exist at all if the decree is thus fixed? Evidently sanitarians have no excuse for existence except in places when the mortality exceeds this mystic number. It is even still more difficult to understand why such a law does not at once dispense with the services of boards of health and health officers in very much the same way in which they were formerly disposed of by our town councils.

The facts of history are directly opposed to these fatalistic doctrines. The annual mortality is not fixed by law, but is ever subject to widest fluctuations, and the death rate of any city or state is largely a question of intelligent oversight. The late Doctor Chadwick, of England, who was called the apostle of public health, calculated that if present knowledge was made fully effective, the death rate of such countries as England and the United States would not be over fourteen in each thousand. Dr. B. W. Richardson places the natural death rate at eight in each thousand. As opposed to these figures Doctor Walcott, of the Massachusetts State Board of Health, finds that the average mortality for that State is 19.4 per thousand. The death rate for the entire country is not less than this.

The sanitarian attacks this problem with the firm belief that the death rate is too high, and that it may be lowered by his personal efforts. He selects a favorable locality for his investigation—the crowded ward of some great city. He stops up a well here and there and introduces a new water supply, brought in clean pipes from a distant source. The death rate, which was thirty-five in each thousand, falls to twenty-seven. He looks after the plumbing and the sewerage and the mortality is less than twenty-five. He guards the drink of infants, teaching mothers to care for as well as love these atoms of humanity, and five additional lives are saved each year. Thus by the very imperfect enforcement of the simplest of sanitary laws, amid unfavorable surroundings, and in the midst of a people often besotted as well as ignorant, the mortality has been lowered forty per cent. In other localities, under favoring conditions the same efforts would bring the mortality below fifteen to the thousand. Such a fall in the death rate is not unknown in actual experiences. It has been accomplished in scores of places,

and even thoroughout states and countries. Many of you gentlemen have assisted to solve this problem and are now enjoying personal satisfaction at the success which has crowned your labors.

Opening a tunnel under Lake Michigan in order to provide pure water for the city of Chicago, reduced the annual mortality from thirty-eight (the highest in the United States) to twenty-one. Vaccination has banished small-pox from the German army and from the German Empire. As a result of gross carelessness, this filthy disease is spreading throughout the army of France, when it should be driven from the world. Who doubts that diphtheria might become as rare as small-pox, or even be relegated to the museum for fossil diseases if like small-pox, it were proscribed? It is far more fatal than yellow fever, and more terrible in its effects upon the system, and yet we are so accustomed to the name, and so familiar with the thing itself that only a small per cent. of actual cases are reported to health officers or come under the care of physicians. The same words apply to very many of our most common diseases. We tolerate them because we are accustomed to them, and therefore do not appreciate their full danger.

In 1879 a German died of yellow fever at Shreveport, in Alabama. He willed all of his property, including personal effects, to a niece at Memphis. In spite of health laws and health officers, in the face of all recent discoveries as to the nature of epidemics, in utter disregard of positive knowledge concerning the spread of contagion—knowledge as old as Moses—the personal effects of this man, including the bed on which he died, were shipped to Memphis. That crime against God and humanity cost the people millions in money, and almost wiped the city from the face of the earth. All forms of business came to a complete stand-atill. The population fled, leaving less than ten thousand persons within the city limits, and these the negroes and shiftless whites. Heroic measures were demanded, and there were heroic men to plan and execute them. As soon as the storm-cloud of disease passed away the city was thoroughly drained by the introduction of two systems of independent sewers. New sources of water were sought for and found. Pest spots were filled and old rookeries torn down. As a result of these many sanitary improvements, the city took on a new form and sprang at once into a wonderful activity. New Memphis is the glory of the South and the pride of the sanitarian. It boasts of a census population of 65,000 and has had a growth surpassed by no other city in the south land.

Honest municipal sanitation is the best possible investment of the people's money. Sanitation does pay. Nashville tells the same story. A death rate of thirty-five has been changed to one of nineteen, notwithstanding the large negro population of that city. The entire population has increased from 27,000 to 68,500.

Dr. Baker, the efficient Secretary of the Michigan State Board of Health, asserts that recent advances in sanitation are saving one hundred lives a year from death by small-pox, four hundred from scarlet fever and six hundred from diphtheria, within the limits of that single State. Eleven hundred lives saved from these three forms of death! And yet modern sanitation is in its infancy.

In the report of the Secretary of the Ohio State Board of Health, of the work of the office for the past three months, there were accounts of a dozen or more outbreaks of scarlet fever, diphtheria and typhoid, which seemed ready to over-run town and city limits and baffle human skill, like the beginning of some mighty conflagration. The outbreaks were checked as if by magic by the application of proper quarantine, changed water supply and disinfection. The lives saved in Ohio during the year 1890, by the action of State and local boards of health, would repay all money expended on these boards for half a century to come. Numbers in the aggregate often startle us, when the factors would be unnoticed. To be saving a life here and there may make little impression upon the world and be of real value only to those few persons whose lives have been saved, but to give added years and possible enjoyment to all the people of a great nation—this is a life reward in itself and we who are laboring in this field of sanitation need ask no other. The expectation of life has been augmented by more than two years. Sani-

tation has added *one hundred and twenty-five millions* of years to the present population of our country. Do you ask me whether sanitation pays? Read the answer.

Our new census tables place the population of the United States at 62,622,250. An annual death rate of 19.4 per thousand means an annual mortality of 1,214,872 persons, a population just equal to that of California. A death rate of 14, as suggested by Dr. Chadwick, would give us a mortality of 876,708. The difference is over 358,000 lives, or a population somewhat greater than that now found in the State of Rhode Island, with its growing cities and multiplied interests. I contemplate these figures with mingled awe and consternation. The work already accomplished seems so slight, when compared with that just in advance of us, and which is awaiting upon our faithfulness.

A population of 358,000 (equal to the combined population of Cleveland and Columbus) is lost to society and to the world annually, because present knowledge is not made effective; because health boards and health officers are not as intelligent and aggressive as they should be; because legislators care far more for votes than for the voters who deposit them; because congressmen will not cease their partisan wrangling long enough to consider questions of truest statesmanship and broadest humanity—in short, because all men everywhere come short of living up to their highest ideal. The great State of Ohio, liberal to a fault in all matters which advance party interests, votes somewhat grudgingly one-eighth of a cent per capita annually for the preservation of the health of the people within her borders and for the study of diseases and epidemics, and yet sanitation pays with compound interest.

Our greatest trouble lies in the fact that sanitation is not a new subject. A new disease like la grippe, or a new discovery like the prepared lymph of Professor Koch, attracts fully its share of attention, but the terrible mortality of city and State is accepted by the non-professional mind as a decree of Providence, or the result of inexorable law, from which there can be no appeal.

The problem presents itself to my eye this evening in panoramic form. I see upon the canvass the great State of California, stretching along the coast for more than nine degrees of latitude and backward into the country for some hundreds of miles. Lofty mountains alternate with beautiful valleys. Rich mines, golden orchards and vineyards, alike cover its surface. But as I look upon the picture I find that the country is tenantless. Not a single human being walks the deserted field or sits in the shadow of the pear or the grape. A destructive death-wave has engulfed the entire population. Such a land is far too beautiful to be given over to bats and owls. It can not long exist tenantless, owing to the over-crowded condition of the world. On the next canvas I see a new exodus. Emigration sets in from all the older States and very soon mountain and valley teem with life as before. Business and commerce are fully resumed. The hum and rush of machinery are heard on every side. The fields are tilled and the crops gathered. An enumeration reveals the presence of 1,214,872 prosperous and happy people, who, within a twelve-month, have made this place their home. The shifting scenes show that hope and fear are equally blended as the anniversary of the fatal day is announced. The day opens brightly without omen of coming disaster and the people return to their several vocations, but late in the afternoon a second tidal wave, of equal severity with the first, crosses the State from north to south and from west to east and night looks down upon a scene of death. As if in full anticipation of this recurrence of the death-wave, life boats, life rafts and other life preservers had been prepared, sufficient in number for the rescue of 358,000 persons, but in the mad excitement of the hour they were not made effective. *Three hundred and fifty-eight thousand lives might have been saved*

This is not a dream, but a most terrible reality. Three hundred and fifty-eight thousand persons are lost to the country annually who might be saved, if present knowledge were only made effective. Each life is worth one thousand dollars to the nation. It will earn the interest on that amount in addition to all necessary personal expenses for food, clothing and shelter. I dare not open the question of the value of a person to the business interests with which he is connected, or to the family of which he

is a part. I must shut my eyes to the suffering in the more than one hundred homes broken up by the sudden accident at Mammoth Mines Colliery on Saturday last. I reduce the population to a single average grade and value the people as a slave-holder would his slaves. On this low basis the average death is a national loss of one thousand dollars. Shakespeare says, "the people are the State." The wealth of the nation is in its people. Death robs the nation of capital. In this sense sanitation becomes a patriotic duty as well as a personal one. The future of more than one nation is in the hands of its sanitarians. The death-rate in France already equals the birth-rate. If they can not increase the birth-rate, they must lower the death-rate, or the first chapter of the "Decline and Fall of the French Republic" will be written in our life time. I see the same hand-writing on our own walls. Notwithstanding the greatly increased population, two million less persons were born within the limits of the United States during the ninth than during the eighth decade of this century. Without immigration and the constant influx of fresh blood, the birth-rate of the white population in this country would not greatly exceed the death rate. Ichabod may yet be written over our doors.

Sanitation is next to the preaching of the cross, man's supremist duty. To convince a single person that a given disease is avoidable may save a human life. To convince him that the disease is contagious may prevent a wide-spread epidemic. To convince the people of a State that diseases may not only be avoided but actually exterminated, means a lowering of the death rate by numbers which are but little short of miraculous. We enter the field with no theories of our own. We bring the God-provided elements—pure air, pure water, pure food, and insist that all the people in our noble commonwealth shall be protected in the use of them. This is our work. We draw our pay from the Bank of Satisfaction at the close of every day's labor. The successes of the past are our stocks and bonds. There is no "profit and loss account," except when we fail to do our duty. The future of the great State of Ohio is in keeping of her boards of health. Sanitation always pays.

MORNING SESSION—January 30, 1891.

President Hoover—The convention will please come to order. The first paper is:

THE INSPECTION OF DAIRIES AND MILK SUPPLIES.

By Dr. G. A. Collamore, Health Officer, Toledo.

The design of this inspection is to insure the production of pure milk, and its delivery to the consumer in a sound and undiluted condition.

To accomplish the first object every thing which pertains to milk production must be brought under survey; to secure the latter result the milk must be under observation or control from the time of its production to the time of its consumption.

Any inspection which fails in either of these particulars is defective.

In order to insure the production of pure milk, the materials of its production should be such as to accomplish this end. It is evident that pure milk can not be expected from impure factors. This leads to the consideration of the milk producers themselves, and, secondly, of the materials out of which milk is formed.

It will be conceded that pure milk can be secreted only by healthy cows. The first care of the inspector must be to ascertain their condition. A cow evidently sick must be separated from the remainder and her milk condemned. Although the exact diagnosis of the disease may not be made at once, yet if she suffers from elevation of tempera-

ture, want of appetite, restlessness or other symptoms indicating illness, her milk should not be used, at least for public sale. More necessary is it to abandon the use of her milk when she is plainly afflicted with those diseases which are liable to infect her milk, and absolutely essential in those maladies which are quite sure to make it dangerous. In the former class may be reckoned anthrax, actinomycosis, in the latter, Texas fever, pleuro-pneumonia, milk-sickness, and especially tuberculosis. While in most of the other diseases named the production of milk is greatly lessened, if not completely suppressed, and there may be a possible doubt as to whether the infecting poison may be excreted through the mammary gland, in tuberculosis the danger is so great that the bacilli, even if they do not pass the lacteal secreting cells, may form foci in the mucous membrane of the milk ducts and thus infect directly the secretion. Too great importance can not be given to the necessity of excluding all such animals from the herd. They should be promptly slaughtered to avoid the spread of infection.

Various local affections, of which the ordinary mammitis, or inflammation of the udder, coming on usually soon after parturition, is probably the most important, should receive careful attention, and the use of the milk temporarily prohibited.

Assuming, then, that our cows are sound in health, the next consideration is as to their diet, general care and environment. It goes without saying that pure milk can only be formed by the use of pure materials. You can not expect figs from thistles.

As water is the chief ingredient of milk, the water supply should be pure. It is an error to suppose that any sewage-polluted pond or slough hole is good enough drink for any animal. Much less a cow in milk. Nothing less than an abundance of pure water, easily accessible, should be tolerated. Cows will often stint themselves in water, if it is far to seek or difficult to obtain, as in frozen streams in winter. Next to pure water comes the food. The natural food is well-cured hay, corn-fodder, etc., reinforced by suitable quantities of corn-meal or other grain, with occasional feeding of turnips, carrots, etc. Every thing should be clean and sound. The substitution of the above or any portion of it by malted grains from the breweries, a practice which is almost universal in Toledo and vicinity, and doubtless in all places where breweries are found, leads to the production of a milk which is, in my observation, up to the legal standard, and usually of increased amount, but which lacks what might be called the staying quality, *i. e.*, its composition is more easily disturbed, it demands greater care in keeping, particularly in hot weather, it becomes more rapidly and easily soured, and is therefore an object of greater care to see that it reaches the consumer in a wholesome condition. For adult consumption this is perhaps of not so great consequence, but for infant use it is of vital importance. It is my judgment, formed on an observation of many years, that milk from cows fed on malted grains should not be given to infants whose sole dependence is upon artificial food.

There are other requirements for keeping cows healthy. The amount of air space, the personal care as to cleanliness, both of bodies and stables, all demand proper attention. The necessity of cleanliness and care in milking is well shown by the researches of Prof. Lister, who has shown that cow's milk, as it comes from the udder, is sterile, and that it quickly becomes infected in various ways—as by the hands of the milkers, the air of the stables, etc. Prof. Soxhlet, of Munich, found that calves one week old, when taken from the udder and fed with their mother's milk from a trough, were affected with a diarrhœa, which disappeared on their being fed again directly from the udder. Soxhlet's experiments also showed that under the same conditions of temperature the milk of three cows, as ordinarily milked, turned sour in about half the time that the same milk did when the udders and milker's hands were carefully washed, and other precautions for cleanliness were taken before the milking."—*Keating's Cyclopædia*, Vol. I, p. 298.

Having secured pure milk, the second problem is how to insure its delivery to the consumer in a pure and sound condition. Let us briefly consider the composition of milk, and the dangers to which it is exposed, even with the honest milkman. According to Payen, quoted in Chapman's Physiology, milk (cow's) is composed of 86.40 parts water,

4.30 parts nitrogenized substances, 5.20 parts lactose, 370 parts butter, with minute quantities of phosphates of calcium, magnesium, ferrum and sodium, chlorides of potassium and sodium, and lactate of sodium. This composition shows it to be a fluid with a large proportion of water, and a small proportion of albuminoids; a fluid which, besides its ordinary dangers of lactic fermentation, is extremely favorable to the development of microbial vegetation; it is, in fact, a veritable culture fluid.

To prevent the intrusion of these foreign flora, as well as to avoid the ordinary lactic acidification, becomes now our chief endeavor.

The first proceeding, after the milk is drawn, should be to deprive it of its animal heat. Prof. Vaughn says: "This is best done by placing the milk in a tank of cold spring water or ice water, the water being at the same depth as the milk in the can. * * The tank should be thoroughly cleaned every day. * * The can should remain uncovered during the cooling, and the milk should be gently stirred. The temperature should be reduced to 60° F., within an hour. The can should remain in the cold water until ready for delivery. In summer, when ready for delivery, the top should be placed on the can, and a cloth wet in cold water should be spread over the can, or refrigerator cans may be used. At no season should the milk be frozen, but no buyer should receive milk which has a temperature higher than 65° F. The only vessels in which milk should be kept are tin, glass or porcelain. After using the vessel it should be scalded, and then, if possible, exposed to the air."

"With the attention demanded by these rules given to milk, it will become more valuable as food, and the development of poisons in it before its introduction into the body will certainly be prevented."

What these poisons are has not as yet been discovered; that is, all of them. Dr. Vaughan is known as the discoverer of one of the most potent, viz: tyrotoxicon. "It is developed in milk by the growth of a germ, which multiplies very rapidly when the conditions are favorable. These favorable conditions consist principally in exclusion of air, or the presence of a limited supply of air, and a comparatively warm temperature, the germ developing most rapidly at about 98° F. If milk be placed in cans and then kept warm, the conditions for the development of the poison are favorable. We do not know exactly what germ it is that produces this poison, but it is either the butyric acid ferment, or some ferment which is frequently developed along with the bacillus butyricus." Dr. Vaughan further says: * * "Nor would I claim that tyrotoxicon is the only poison that may be developed in milk. It is *only one of a large class of bodies which are produced* by putrefaction."

Prof. Booker, of Baltimore, says: (Keating's Cyclopædia, Vol. III, p. 189.) "All the varieties (of bacteria) thrive, and many produce important changes in milk. Some cause coagulation, with acid reaction; some render it acid without coagulation; some alkaline without coagulation, and others change slightly acid milk into alkaline, and then coagulate it with alkaline reaction. * * Seven varieties in addition to the bacillus lactis aërogenes produce active fermentation in milk, but the nature of the fermentation has not yet been ascertained."

Dr. Jeffries remarks, "that it is a curious fact that, while older people are chiefly fed on sterilized food—that is, cooked food—infants are fed on food peculiarly adapted by its composition and fluid state to offer a home for bacteria."

The milk, having been properly cooled, is now ready for distribution to the consumer. Hitherto, the milk inspector has had to contend mainly with the ignorance or carelessness of the producer; now begins the contest with the cupidity, perhaps dishonesty, of the distributer. Although the law of the State prohibited sophistication of milk, either by the addition of water or other substances, or by the subtraction of cream, it was practically impossible, prior to the act passed April 10, 1889, to convict any one of these offenses. The lactometer, the cream gauge etc., might show a loss of sp. gr. or of cream, yet, so long as there was no legal standard of the purity of milk, courts looked with

great charity on those accused, and found no difficulty in acquitting them. If the experience in the other parts of the State has paralleled that of Toledo there were no convictions anywhere, though earnest and competent inspectors did their best.

The law of 1889 reads as follows:

"An act to regulate the sale of milk.

"Section 1. Whoever, etc., sells, etc., adulterated milk, or milk to which water or any foreign substance has been added, or milk from diseased or sick cows, shall be fined not less than $50 nor more than $200; for a second offense not less than $100 nor more than $300, or imprisonment in the work-house not less than thirty days nor more than sixty days; for a subsequent offense by a fine of $50, and by imprisonment * * not less than sixty days nor more than ninety days.

"Section 2. Whoever, etc., sells, etc., as pure milk, any milk from which the cream, or part thereof, has been removed (shall be punished as above).

"Section 3. Allows skimmed milk to be sold as such if labeled as directed.

"Section 4. In all prosecutions * * if the milk is shown upon analysis to contain more than 87 per cent. of watery fluid, or to contain less than 12½ per cent. solids, not less than one-fourth of which must be fat, it shall be deemed * * to be adulterated; * * except during the months of May and June, when milk containing less than 12 per cent. of milk solids shall be deemed to be not of good standard quality"

The efficacy of this law resides in section 4, which determines the legal proportions of water to solids, and it is at once seen that this proportion is virtually that established by the chemist, the favor, if any, being to the honest milkman.

Thus, the law allows 87 per cent. of water, while the chemist says 86.4, a slight discrepancy only, and it may fairly be assumed that these proportions are not absolute, but vary within moderate limits, a fact which is recognized in the clause allowing 88 per per cent. water in May and June milk, the presumption being that fresh grass will produce a more watery milk than dry hay, but which becomes an assumption in view of the quantity of malted grains fed in and about brewery towns.

Of the remaining 13 per cent. solids—or 12½ per cent. according to the law—not less than one-fourth must be fat, that is, 3⅛ per cent.; the chemist says 3.70 per cent. should be butter, a leaning of .57 per cent. in favor of its vendor.

It is understood, of course, that this is the milk of ordinary grade cows; the milk of Jerseys and other higher grade stock will show a vastly greater percentage of fats.

It is, therefore, the business of the inspector to intervene between the vendor and the consumer in order to secure the receipt by the latter of legal standard milk in a sound condition. This is done by frequent sampling of vendor's supplies. If the lactometer and cream gauge show deficiencies in solids or cream, it is then the inspector's duty to make a chemical examination of the milk, or if not skilled in chemistry, to turn it over to a competent chemist for that purpose. It is only on the oath of the chemist that the milk is deficient in solids or cream that convictions for falsifications can be had. With the testimony of the chemist unimpeached, it is difficult to see how conviction can be avoided.

In addition to milk sophistication, devices to preserve the sweetness of milk for a longer time, or to postpone lactic fermentation, are at times resorted to. It is established that pure milk, in which all microbial life has been destroyed by heat, can be kept almost indefinitely, if access of microbes be prevented. As it is not practicable to prepare milk in this way in general, it should be preserved by a low temperature, often a difficult thing to do, especially in summer heat. The journey from the dairy to the house of the consumer is particularly dangerous at this time. Properly, the milk should be transported in refrigerator cans, cooled from the outside. The practice of adding to the milk some chemical substance to delay fermentation, as salicylic acid, boracic acid, etc., or of introducing pieces of ice into the milk itself, can not be too strongly condemned.

Under the most favorable circumstances the milk is agitated or churned for several hours before the last customer is reached, a circumstance which certainly does not add to its quality.

In consequence of this deterioration of milk by agitation the custom has arisen and is becoming more common, to provide milk for those who desire it, and especially for infants to whom it is the sole food, in air-tight cans holding the requisite amount when filled completely. This is an admirable expedient, when the milkman can be trusted.

The subject of milk inspection is one of great interest and importance and much more might be said upon it; but to conclude, the duties of the milk inspector may be summed up as follows:

To be absolutely certain that the cows are healthy. There can be no departure from this rule. He should also know all particulars as to the feeding, stabling, air supply, milking and preparation of milk and be prepared to give advice, and, if necessary, directions how these things should be done.

This covers the inspection of dairies.

The milk supplies must be watched and examined as frequently as may seem desirable, and every effort made to insure the delivery to the consumer in a sound and unadulterated condition. To this end the present State law, if enforced, gives all needful aid, and with vigilant inspectors and competent courts, the interests of the vast multitude who live wholly or partly on this ideal food, should be well-guarded.

President Hoover—The paper is open for discussion.

Mr. Hiler—I will give you the history of our milk inspection. Last spring we bought the milk inspector a lactometer and directed him to make inspections as often as necessary, and report. The first report showed that only one man out of eleven had poor milk. The cows of this peddler ran in a beautiful carp pond, and this milk lacked thirty per cent. of being pure. Whether it was due to the water drank by the cows, or the cans, we have not been able to ascertain.

Dr. LeFevre—Recognizing the importance of a pure and wholesome milk supply, our board decided to investigate ours, and a non-professional man and myself were appointed to do the work. We have five dealers who supply the town with milk, and we made the investigation quite carefully, taking a great deal of time, and leaving no stone unturned to get at the true state of affairs. We visited all the dairies, taking good care not to let the owners know when we were coming. We made examination of the cows as to whether they were diseased or not, also of the condition of the stables, method of milking, taking care of the milk, and so on. We found nothing very startling, yet did find some things that were not quite proper. The dairies were all in the country where the cows were not slop-fed, but had access to good pasture and, I think, good water, all the year round. There were some things in connection with the stables and manner of taking care of the milk that we objected to. For instance, in one case the dairyman, before our eyes, took a bucket of water and washed the udders of the cows. He then just tossed the water out, leaving perhaps a tea-spoonful or a table-spoonful of dirty water in

the bucket, and commenced milking in the same bucket. We made a report to the board of health, and at the end of the report we attached some rules which we formulated, and these I will read:

1. None but healthy, vigorous cows should be milked. Those that show failure of health, or disease in any form, should be retired at once.

2. Stables should be kept as clean as circumstances will permit. Filth and dirt of any kind should not be allowed to accumulate either in the stables or barn yards, and cows should not be compelled to wade through mud knee deep, as we found them doing in some cases.

3. Great care should be taken to keep the udders and teats of the cows clean. They should, in our opinion, be washed at least once a day in all seasons of the year, and during the muddy season this should be done before each milking. In no case should the vessels used for washing or cleaning the cows be used for milking purposes, as we found being done in one case, without even so much as a preliminary rinsing.

4. Persons who do the milking should see that their hands and finger nails are kept clean, and in no case should any person who is afflicted with any contagious or infectious disease be allowed to have any thing to do with the care of the cows or the milk.

5. Boiling water should be used freely and faithfully in the cleaning of all cans, cloths and other articles used in connection with milk, as it is now well established that the liberal use of boiling water or steam is the only safe method of cleansing and purifying milk vessels.

We believe that a faithful observance of the above regulations would not only protect the consumers against impure milk, but would result in a pecuniary advantage to our dairymen.

These rules have been adopted by our board, and the dairymen have been notified that if they violate any of the same we will publicly expose them, and this fear will, I think, effectually keep them in order. I agree thoroughly with the author of the paper in regard to the feeding of brewery grains to cows. One dairyman uses the product of the brewery for his feed, and after a careful examination of all the milk, I find that that from brewery-fed cows shows the highest specific gravity and as much cream as the other, but the milk decomposes much more readily, and is not of so good a quality.

Dr. Conklin—We, in Canton, have had experience with malt milk, and have forbidden any such milk to be given to infants.

Mr. Hunter—For four years, in our town, the supply of every milkman has been tested every month, by all available means except analysis, and the sanitary policeman is instructed to pull these milkmen down every now and then—sometimes oftener than once a month. The results of these tests are published in the newspapers, though not by our direction. Our meetings on Monday night of each week are public, and there is always a reporter there who gets the information and publishes it, and this has a beneficial effect. The milk peddler is also required to take out a permit, making application for certificate twice a year, in April and

October, for which he pays fifty cents. In making this application he must give the name of every person of whom he gets milk, if he does not take it all from his own cows, and if he is caught getting milk from any one else he is arrested and fined. Our sanitary policeman makes these inspections, taking a member of the board with him. He makes the inspection of dairies in March and September, and as much oftener as he pleases. In regard to the water supply, there is no use temporizing about that at all. If we find any trouble of that sort, we refuse to allow them to sell a pint of milk until a pure water supply is provided.

Dr. Conklin—I would like to inquire as to the advisability of requiring milk venders to be licensed by the board?

Mr. Hunter—There is no way to get a hold on these people except to license them. There is perfect authority for it. Do not charge a high price for the license, but a reasonable compensation.

Dr. Conklin—Can a board of health do it without an ordinance of council?

Mr. Hunter—You can by adopting rules governing the matter.

Mr. Morris—Do you require a license of meatmen, milkmen and all?

Mr. Hunter—All of them; none can sell without license.

Mr. Morris—What do you do with the farmers?

Mr. Hunter—Oh, farmers are always honest; but if we find they are not, we go for them.

Mr. Morris—You don't require a license from them?

Mr. Hunter—If a farmer sells his meat by the quarter, we do not; but if he sells it at retail, cuts it up and sells it, he must take out a license.

President Hoover—We will now listen to the reading of a paper by Dr. S. A. Conklin, on Vaccination:

VACCINATION.

By Dr. S. A. Conklin, Member State Board of Health, Canton.

I am aware vaccination is a subject about which much has been written and considerable more said in the past century. We are also all aware that every year or oftener in some locality in our State where active measures are not taken to prevent the introduction and spread of this, the most dreaded of all loathsome disease known to mankind, it threatens us at all times and in many ways, but we must admit we have been remarkably free from it to any considerable degree for the last decade, and more especially in our own State I will modestly attempt to give you a few plain facts and extracts culled from various authors, and hope to correct many absurd arguments and remarks we often hear among the laity from time to time, that many persons meet an early death by submitting to vaccination.

Vaccination is a process by which a fixed specific disease with all the marked characteristics generally known as vaccinia, is introduced by inoculation from one person into another. In the light of the most recent researches and still more recent contro-

versies, it will be wise for me to refuse to pronounce on any disease with which we have not a present acquaintance or description, for we all know, who keep abreast with the times, that very many of the conditions considered as variola, are fast being relegated and mixed with the group called specific infective disease. The object of complete vaccination is ultimate protection against small-pox. Edward Jenner, an English surgeon of considerable note, in 1776 began to scientifically study the traditional belief of his country neighbors that cow-pox was a preventive to small-pox. In 1796 vaccination on man was first performed, and in 1798 he published his first paper on the subject. Of course his first experiments met with considerable opposition, but he continued and pressed his experiments and soon overcame the greatest opposition. In many of the foreign countries numerous trials and experiments were made with vaccination, and it was found that small-pox could not be produced even by inoculation in vaccinated persons. In 1799 in London, England, there was established the first public institution for vaccination. In 1800 it was introduced in the United States, Germany and France. The history of vaccination is traditional in character. Its existence was much earlier than many suspected, and was practiced to a limited extent in other countries. Von Humboldt claims it was practiced by the Mexicans from an early period. I believe Sulzer in 17.3, and Sutton and Fewster in 1765 knew of its properties. But to Jenner himself must the credit be given, for the careful observation and study he gave it, and from the date of his first observations in 1768 until he announced the results to his countrymen, thirty years had elapsed, and all this time he had been giving it patient research, and of course if ever a discovery was announced to the world with great deliberation, it was vaccination. I am sure that a greater deliberation was bestowed upon vaccination than has been bestowed upon the Koch discovery for consumption, and its kindred diseases thus far.

I will briefly mention a few of the principal points which Jenner fully established by his research:

1st. That when this vaccine disease is communicated to a person it has the power to free that person from any susceptibility to small-pox.

2d. Specific cow-pox alone has this protective power, and not other eruptive diseases that may affect the cow, and be confounded with it.

3d. We all know that the cow-pox can be at will readily communicated by the skillful hand of the surgeon from animal to man.

4th. When once skillfully placed or engrafted on the human subject, it may be successfully carried along from one individual to another from time to time by repeated transmissions, thereby conferring on each person the same immunity as was produced by the first infection directly from the animal. When vaccine lymph is first introduced into the human subject it requires about forty-eight hours before its local effects are noticed; the period of incubation is short, and if the vaccination is successful you will notice more or less redness and swelling where it was introduced. On the third or fourth day you will notice a small papilla with a little vesicle appearing at its summit filled with a limpid fluid, which grows larger and larger each day. It attains its largest size in about nine or ten days, then if the vesicle is ruptured there will ooze out a clear liquid. After seven or eight days an inflammatory ring called the areola will form about its base, and the areola and vesicle will continue to spread for two or three days thereafter. On the tenth or twelfth day the areola begins to fade and vesicle to dry, especially at its center. Then by the fourteenth day the crust becomes dry and hard, and about the twentieth to the twenty-fifth day it will loosen and fall off, leaving a cicatrix. With all the efforts of its most bitter opponents, no thoughtful person in this day and generation can longer be in doubt as to the actual efficacy and pre-eminent practical value of vaccination.

This minor operation called vaccination ought to be performed in early childhood. The infant should be at least from six weeks to three months old. Under five or six weeks no infant should be subjected to the operation unless in case of some real necessity,

such as small-pox being either in the immediate neighborhood or in the family. The proper and most acceptable time is at the age of from three to six months. The child should be in fair good health, entirely free of any eruptive, cutaneous disease, free from teething, disorders of the bowels, or in fact any disease peculiar to this age in childhood. The protective influence of the vaccination otherwise can not be depended on. Children suffering scrofula or inclined to same ought not to be vaccinated during the first year, or until after decidual dentition is completed. Unsuccessful vaccination, after an interval of a few months, should be repeated until the operation proves successful. Ziemssen and other standard writers claim that vaccination will give immunity generally from seven to twelve years. I think it is generally understood that in order to maintain a state of perfect immunity as above stated, a re-vaccination is necessary, and this rule should be carefully observed throughout the remainder of one's life, then I am sure cases of small-pox would be reduced to a minimum, or scarcely known. Bovine virus should have the preference over any and all classes of humanized virus. With the bovine there can be no danger of communicating any constitutional or infectious disease from one person to another, as is the case, as we all know, when humanized virus is used. I have personally used nothing but the bovine for many years past, and have recommended it at all times to my brother practitioner, regardless of its cost. I prefer points prepared to resemble somewhat a lancet, and then the perfection in vaccination is to use the point as instrument in vaccination of each individual case, thus obviating any and all danger that might occur in using lancets that have been used in prior cases, and perhaps not been scrupulously cleansed. My mode of vaccination is to make three groups of slight scratches with but little or no blood exuding, say rather serum slightly tinged with blood. Gentlemen, I exhort you never to use a single point for more than one vaccination. It is abominable stinginess, and I should most certainly pronounce it malpractice, for there can be no perfect security from syphilis, or erysipelas, or any inoculable disease that might be conveyed into the system, I care not how pure and free from impurities the vaccine employed. Many authors claim that one important cause of the extensive ulceration and deep sloughing attending the course of vaccination sometimes complained of, is attributed to the recklessness of the surgeon by vaccinating on too large a surface, which coincides with my experience of a few cases in the early years of my professional life. Of course, a broad and extended pustule will be attended with more topical inflammation and more likely to lead to sloughing, for the vaccine pustule is always confluent, especially if active lymph is employed. The so-called cases of vaccina roseola, or erythema, is produced by the use of lymph plentifully supplied with germs, or when it proves active, and therefore good, it is followed by freer confluence. These conditions often attend the natural course of vaccination, and should only be considered as positive evidence of the purity of the lymph used. The protective power of complete vaccination, as I understand it, is the universal belief of the entire medical profession, with precious few exceptions. The Epidemiological Society of London, way back in the fifties, obtained the written opinion of nearly two thousand professional men, and they all concurred in confirming the belief of the protective and modifying influences of vaccine in small-pox. The Royal College of Physicians and Surgeons of London soon after its discovery, unanimously declared in it favor, and it seems to me that all cautious and reasonable thinking persons should at all times advocate its general usefulness. Ziemssen says: "In spite of the efforts of its opponents, no unprejudiced person at the present day can any longer be in doubt as to the efficacy and eminent practical value of vaccination." In all sections and countries, wherever properly and systematically carried out, the number of cases, the intensity of the disease, and the extent of the epidemics certainly have been greatly diminished. Some may say it is a mere coincidence, but by considering many facts we have before us from time to time, coincidence is entirely out of the question. In the Prussian army, I believe it was, where they regularly and with perfect system carried out vaccination among the soldiers, epidemics of small-pox were not known.

Anomalies, complications and sequels I will briefly mention. In rare cases, the inflammation surrounding the vesicle becomes intense and deep seated, the result being an abscess; however, this occurs only with those who have a scrofulous tendency or a vitiated state of the system. The complication I most dread is erysipelas, and this may occur as from any other wound or from the inflammation caused by the vesicle when the virus is scrupulously clean and pure, or it might occur from some other unknown element in the virus. It may occur at any stage of the vaccination. We all know the physician is often unjustly blamed in these unfortunate cases, for using impure vaccine. In these cases as a rule, the predisposition to erysipelas is strong, and the operation was simply the exciting cause. A simple wound or a non-specific sore would as soon excite a case of erysipelas in the same persons. It is proof when you use the same virus on two or more persons, and one has erysipelas and all the others have simple uncomplicated vaccinia. Scrofula and phthisis are among the chief diseases which are claimed to be directly transmitted to healthy persons, but I have never seen the slightest evidence adduced to prove the assertion. The more intelligent laity of any community fear the transmission of syphilis in vaccination more than any of the other inoculable diseases. I think I am safe in stating, if bovine lymph is used, the transmission of syphilis need never be feared.

As regarding the laws of our State respecting compulsory vaccination, they are very meagre, and not fully up to what the people of our State should have. I find in section 3986, R. S. of Ohio, the following: "The board of each district may make and enforce such rules and regulations to secure the vaccination of and to prevent the spread of small-pox among the pupils attending or eligible to attend schools of the district, as in its opinion the safety and interest of the public require; and the boards of health and councils of municipal corporations, and the trustees of townships shall, on application of the board of education of the district, provide at the public expense without delay, the means of vaccination to such pupils as are not provided therewith by their parents or guardians."

It is forcibly impressed on my mind that such a powerful and effective weapon as vaccination has proven itself to be against the scourge of small-pox, should not be left entirely in the hands or at the pleasure of the individual, but the State should assume the right and make herself responsible, and look after its most thorough performance in every detail. As in many other spheres where a certain needed attainment is required for a result, perfect co-operation is requisite.

So my limited personal experience in case of vaccination teaches me that trying to instruct and admonish simply are almost powerless in a struggle against carelessness, a proper sense of duty, or may be an evil disposition which oppose this needful measure, at all times. We physicians who have made ourselves acquainted with the facts, have long since concluded that to the attainment of the desired ends, legal compulsion is absolutely needed. Indeed, the world over, ever since vaccination has been employed (imperfectly too) against the plague, the average length of life has been materially lengthened. All state authority, free from prejudice upon this subject, can readily understand the effectiveness of this method. Furthermore, compulsion is entirely justifiable on this ground, that positive certainty of success is impossible, so long as a few individuals refuse, and are not subjected to the operation, knowing the great contagiousness of small-pox, and how readily these persons may become conveyers and diffusers of the poison. If vaccination were to be considered in the light of a sacrifice, I can readily see where the State can, under certain circumstances, demand this from the few in the interest of the many. Even the selfish pretext that vaccination is liable to effect and injure, becomes, as I have tried to show, and as any one can soon learn by reading modern authors, in so far untenable, as the great number of the once accepted dangers of vaccination have been proven to be in every way entirely imaginary, and the real harm, which very rarely occurs, can be fully avoided by using bovine virus, proper caution and experience.

We therefore would take pleasure in asking and urging the executive and our legislative body to enact a law concerning vaccination. A law that will compel every child to be vaccinated before the termination of the calendar year following its birth, and every pupil in a public or private school or institution of any kind should undergo re-vaccination within the tenth or twelfth year after his birth, for we must acknowledge or recognize the fact that in all civilized society the life and health of every person is more or less bound up with the life, health and comfort of every other individual person. Not only is man to a certain extent his "brother's keeper," but a certain responsibility for the welfare of all mankind rests upon each individual in respect to the general health; and every person should claim a vital interest in the health of the public, because it bears strongly in favor of self-preservation. The formation and growth of laws in favor of the preservation of human life and health is of slow growth. We are all aware that many points in sanitary science pertaining to the public good can best exist through the strong arm of a public law or some governmental method. In conclusion, gentlemen, I will quote a few sentences that bear on this subject closely, from Dr. Henry B. Baker, of Lansing, Michigan, late President of the American Public Health Association. Speaking of state boards of health, and the high degree of pride that should be taken in them, he says: "Statistics which appear to be trustworthy seem to prove that in one State, and apparently through measures inaugurated and maintained by the State Board of Health, the deaths from small-pox have been so reduced that more than one thousand five hundred persons have continued to live, who would have died from that disease if its mortality rate had continued as it was before the establishment of the State Board of Health. A thousand and five hundred lives saved from small-pox means a saving also of at least six thousand cases of sickness from that loathsome disease."

President Hoover—Opportunity will now be given for discussion of this paper.

Dr. Reed—I think no one will question the value and necessity for vaccination, at least no physician will do so. In regard to compulsory vaccination, I concur with the author in every respect. The only question is as to the details of procedure in carrying out such a law. One way is to compel every child to be vaccinated within a year after its birth, and to be sure that every child is vaccinated upon entering school, no matter whether they have been vaccinated before that or not. I also believe in vaccinating until it will not take any more; usually the third vaccination will not show much effect. The next step is what kind of virus shall we use—what is the best to use. It has been my lot to do a great deal of vaccinating; during a small-pox scare a few years ago, and for five or six weeks, I vaccinated on the average of twenty-five people a day. I was careful to observe the effects of the different kinds of virus, keeping a complete record of each arm vaccinated, whether re-vaccinated, etc., and the result of my observation is that Lancaster virus proved a failure more than any other. I attributed this fact to its being old, though it is put up in glycerine to make it look fresh. From these records I also fine that in hundreds of cases not one case wherein humanized virus was used was unsuccessful, and in case where the sore proved unusually bad, bovine virus had been used. Bovine virus is much more severe than humanized virus, and I don't believe it protects a bit better. Many peo-

ple do not stop to think that they may have virus from a tuberculous cow. No virus should be used unless it can be procured of a reliable firm, and whether bovine or human, it should always be registered and dated.

Now, the question comes up as to points. I wouldn't give five dollars for a bushel basket of points. I have found more failures from use of points than from either kind of fresh virus. When you use points, you must take the chances of the honesty of the fellow that dips them, and take the chance of their losing their vitality by being dried. I prefer using the simple scalpel.

Dr. Mullen—With regard to humanized virus—I agree perfectly with Dr. Reed. In our locality it has been the most successful, and I have had no such bad results as from bovine virus. In using bovine virus I have found many cases where large ulcers form, and a great complaint has been made about it.

Dr. T. Clarke Miller—Mr. Chairman, the uneasiness of the people in reference to vaccination is a thing which the profession has cultivated, and you didn't hear much about it until since the war. There is not, I think, a professional gentleman here who can point to a genuine case of communication of syphilis through vaccination; and it has been well said that cattle are not all healthy. We have heard enough about that to warrant us in believing that the human animal is about as clean and safe an animal as there is. At any rate we know more about his diseases. and dirty habits and all that, than about the others. In the army, during the war, when they used to bring the men up in rows, and the doctor would stand with a pot of putrefying stuff in one hand and scalpel in the other, vaccinate each and pass to the next without ever thinking of cleaning the scalpel, but use it covered with blood from the last wound—how many cases of transmission of syphilis were there?

This bovine virus is a humbug. I go back to the time when we used to vaccinate in the good old way. I would go and vaccinate a baby—I knew those babies, they were my own babies in a certain sense, and sometimes I would decide prematurely what babies I would vaccinate, taking into consideration the history of the father and mother. I would select a nice, wholesome little fellow, and at six months I would vaccinate him. I would go back on the third day and find a little red sore; would go back on the eighth or ninth day and find him pretty sick, and on the twenty-first day I would go and take the scab off—if I had waited until the next day, I would probably have lost it, and if I had gone the day before it would not have been quite ready. I could tell each day just how I would find it. How many of you see the typical course of vaccination with bovine virus? If you go to vaccinate a little fellow who has a miserable

scrofulous constitution, you should say to the people that we may have some trouble here; we may have a sore that is not natural, for that is sometimes the case. I think as far as the profession is concerned, as a whole they would like to go back to the humanized lymph, and they can thank themselves, or their foolish brethren, for setting up this alarm among the people which makes them demand animal virus.

Dr. Collamore—I am informed by reading that Dr. Jenner derived his virus from the heifer. Speaking of the matter of bovine virus, it strikes me that it does no harm, certainly, to divert occasionally to first principles. In no other business as in the matter of virus does the personal equasion come more into play. In regard to human virus, I am a good deal of the opinion of Sam. Weller as to veal pie—"A very nice thing is a weal pie when you know the lady as made it." Now, in regard to human virus, I should be perfectly satisfied with it if I knew where it came from. If I can select my babies, as Dr. Miller does, I am perfectly satisfied with human virus, and I believe it is perfectly satisfactory, and as efficacious as bovine virus. But if I have any doubt about it, I would prefer bovine virus; but in bovine virus the personal equasion comes in—I want to know the lady as made that, too—the firm or individual who produced it. There is a question of probity there, of honor; I want to know whether he is supplying it as a commercial commodity only, or whether he has a pride in his product, or a reputation to sustain. I have used the points extensively for a good many years. My percentage of failures with points has been as small as that of Dr. Reed's with human virus. I am particular to get the points from reliable sources, and find them so much more convenient than the crust. We have an ordinance in our city requiring all children to be vaccinated before entering school, but up to last year its enforcement had been neglected. During the time recently when the country was somewhat spotted over with small pox, and when it got pretty close to us, there was no trouble in enforcing this ordinance, and before the winter was over more than 12,000 children had been vaccinated in the city. Nearly all of these were vaccinated with points, and it was generally remarked that seldom had the percentage of successful vaccinations been as great as in this instance. Those are facts, and so far as they go they speak in favor of bovine virus, which was almost exclusively used. So I say, let us have both these sources of virus; both are good. In the embarrassment of selection we may say, "How happy were I with either, were t'other dear charmer away."

Dr. Beardsley—I would like to inquire as to the use of plasters on the wound, which are not antiseptic. Nothing has been said on that point. I have found that beneath the plaster—whether it be a rubber plaster, or any other that will fasten itself—an action which is entirely separate and

distinct from the effects of the virus, and I therefore object to plasters. I have not the faintest idea that syphilis, scrofula, or any such diseases are transmitted by vaccination. I can not understand how two bodies can occupy the same space at the same time. If the virus itself is not contaminated with the blood, I don't think you can get contamination even from a syphilitic individual. I know of an instance where a whole family were vaccinated from a child whom I knew was syphilitic, and none of them took it as far as I could discover. Now, I want to know whether it is good policy to take a piece of sticking plaster, wet it by drawing it across your mouth, and stick it on the wound after vaccination.

Dr. Conklin—I think it is due me that I should make some reply to all these remarks. I am very much surprised to know that Dr. Reed is using plaster, as that is pernicious in the extreme. As to Dr. Miller, his baby question is all right, providing he knows who and what the baby is. I don't object to humanized virus, if I know it is pure and from a good family. I think Dr. Collamore occupies very safe ground, and I think it is the safest ground for all. For the last ten or twelve years I have used points, using those I had confidence in, and have had no ill effects from them. But I would advise Dr. Reed not to use adhesive plasters.

Dr. Reed—I suppose this necessitates bringing me to my feet again. The question of plasters, I think, is simple. I will just ask which you would prefer next to the wound, a nice clean plaster, or an old dirty shirt sleeve? The average scholar comes with dirty clothes on, and I prefer using an antiseptic plaster, moistened by steam, to pulling this dirty sleeve down over the bleeding arm. I consider it a choice between two evils, and the plaster the least evil of the two. I always tell them to take it off at the expiration of ten or twelve hours.

Dr. Miller—Perhaps my protest against the animal virus was made too emphatic; these gentlemen seem to identify me with it too much. The fact really is that I haven't vaccinated any body with human virus for many years. Not that I prefer animal virus, but it has so far displaced human virus, that it is difficult to get human virus that is satisfactory. I like the points because I have a new instrument each time, and in case of small-pox scare, think the only way to take care of the people is to send for points from a reliable source and use them. I get my virus from Martin, near Boston, the pioneer in that line of work, and the first to attempt the cultivation of animal virus in this country. And I have every reason to believe, from persons who have visited his establishment and looked it over carefully, that he takes all possible care in selection of good healthy young animals, and feel quite safe in the use of his virus. Have had no bad results from it yet.

President Hoover—I suppose some members are acquainted with the U. S. Army regulations with reference to vaccination, which require that all recruits who have not been vaccinated shall be vaccinated with humanized virus; and all recruits who have been vaccinated and have had vaccinia shall be vaccinated with bovine virus. This information I lately received from the Post Surgeon here at the barracks.

This discussion is very interesting, but a number of the members of the convention desire to leave for home by the noon train, and we will now hear the next paper:

THE REGULATION OF BURIALS FOR THE PREVENTION OF INFECTIOUS DISEASES.

By Dr. H. T. Sutton, Health Officer, Zanesville.

The board of health of our city has been in life but a year and a half, and although much complimented by the invitation to read a paper to this meeting, my inexperience compels a doubt of my ability to do justice to the importance of the subject.

However, I have given it much careful thought and am deeply impressed with its significance; and I am sure that my brethren of the health department, as well as all thoughtful citizens, lay and professional, must agree in that estimate and concur in the belief that one mighty and increasing effort must be made to prevent the spread and ravages of infectious diseases. This grand work can not be accomplished until the people learn how disease is transmitted, and understand what is necessary to do to prevent its spread. Our part should then be to interest them in sanitary progress, to show them without exaggeration the sources of avoidable diseases, and we will soon find them co-operating in our labor. Following this idea, I think the introduction of this particular branch of sanitation in a brief form into schools an excellent one, impressing upon the rising generation the necessity of preventing the spread of infectious diseases, and teaching them how to accomplish it.

When the physician's task is finished, when in the course of nature the patient has succumbed to dread disease, death does not lay at rest all apprehension. The difficulty of fighting the disease has but newly begun; for the germs of poison are permeating the air, the clothing, and all that has come in contact with the sufferer; and so surely as the blossom under the summer's sun perfects into fruit, so these dormant germs, when proper soil presents itself, will ripen into deadly disease. Prompt and careful precautions must then be taken, primarily in preparing the body for burial, and in disinfecting the atmosphere and contents of the room.

This duty can not properly fall upon the health officer, who in many cases is not immediately notified, and often is excluded from rendering personal services on account of dislike or the prejudice of the family, who regard him as an intruder. It is the undertaker then, who by his practical suggestions, his unobtrusive decision and firmness, can control these matters and take all necessary precaution against the spread of the disease, from the time he takes charge until the body is removed for burial.

The three things he should keep well in mind are:

First—To destroy the virus at its point of origin.

Second—To purify the air.

Third—To disinfect the clothing and other contents of the room.

In order to destroy the virus at its point of origin, in other words, to disinfect the body, it should be thoroughly washed in a disinfectant solution; the cavities of the body should be injected with an antiseptic fluid of full strength. The body should then be

at once wrapped in a sheet, saturated with a strong disinfectant solution, of which corrosive sublimate should be the principal ingredient, and this sheet should not be disturbed or any part of the body again exposed. The next step should be an attempt to disinfect the room and its contents by means of chlorine or sulphurous acid gases. Of these, sulphurous is the cheapest and, upon the whole, probably the best; but according to late experiments it must be used in larger quantities and for a greater length of time than has been the custom, if it is to be relied upon. For this purpose, after all the openings in the room have been closed, and all articles which can not be treated to a disinfectant solution have been opened, so they may be exposed throughout to the fumes, not less than two pounds of sulphur to each one thousand cubic feet of space should be burned. The room should remain closed for at least twenty-four hours, then be aired thoroughly. All clothing, bed linen, etc., should be placed in a tub or bucket containing enough boiling water to entirely cover them; a disinfectant might be added, and in this vessel they should be removed from the room to where they can be boiled for at least one hour. Special care should be taken that no article be removed from the room while dry, and while in the room should not be disturbed any more than is necessary. Filthy rags and all useless and suspected articles, such as toys, should be burned in the room. Dust and dirt should be removed, not by sweeping and dusting, as is generally the custom, but by damp cloths, which should be burned on the spot. This virus or poison germ can really be destroyed, and we have the means of killing it—poisoning it, as it were. Numerous experiments have demonstrated the remarkably effective action of the various antiseptics on these germs, which antiseptics are familiar to us all, and found in almost every text-book and journal.

In regard to the burial of the infectious body, all authorities agree that it should take place as soon as possible. Of course due respect must be paid to the dead, but we can not afford to risk the public health for the gratification of sentiment, and should be ready to sacrifice private feeling for the prevention of human suffering, remembering the old saying: "The greatest good to the greatest number." Private funerals are not as yet much in favor in our part of the country, but I think it would be a wise rule for friends not to enter the house of the deceased at all, but to content themselves with merely following the remains to the grave, and in this way show their sympathy and condolence.

Probably the greatest responsibility that rests upon the health officer, is in regard to the shipment of bodies. In this matter too great care can not be taken either by the health officer who signs the permit to transport, or by the health officer who receives such transport permit. The bodies of persons who have died of infectious diseases should, in addition to the precautions taken for speedy home burial, be placed in an air tight casket and encased in a strong wooden box. The box should be plainly marked with a colored paster, showing the name, age, cause and place of death, the point to which it is to be shipped, and name of person in charge. No article which may carry lurking infection, nor any person who has been exposed to it, should be allowed to accompany the body. This point should be particularly impressed upon the people. With the last thud of earth upon the grave, we feel that our task is finished, and apparently, it is; but only apparently; for there can be no doubt that when a person dies from an infectious disease, the body is thoroughly infested with the germs that caused the disease, and if it is buried in a cemetery where drainage favors it, the germs may be carried to spring, wells or rivers, perhaps ever so remote, and retaining their virulent energy, may do great harm. Koch says: "It is the pollution of waters which is the principal cause of epidemics," and it was Sir Henry Thompson's conviction that "no dead body was ever placed in the earth without polluting the earth, the air and the water, above and about it." In digging new graves, how do we know but that infection, buried long ago, may be unearthed, a legacy from some long buried ancestors.

The history of epidemics shows that they are often more prevalent near cemeteries; and diphtheria has been shown to have originated directly from and been diffused by the emanations from the victims of the disease.

Fire is a never failing germacide, and although rarely used for that purpose, it has been resorted to at different times from the earliest ages. At present some slight effort is being made to bring it into favor, but as yet, the influence on burial customs has been so trivial that but little attention has been given to the effect that may be wrought by it. Perhaps in the future, there may be some changes in the law now existing, by which bodies dead from infectious diseases may be cremated, thus removing all possible danger.

President Hoover—The paper is before the convention for discussion.

Professor Nelson—I have heard a great many papers on the preparation of the body for burial, and one matter connected therewith has not been mentioned, and that is the nature of the clothing or robing of the body. It has been found that disease germs will live in connection with wool cloth longer than with cotton, and this suggests the possibility of getting rid of the disease germ by insisting that all robing of the dead be of linen. It may be that Moses understood this law better than Pasteur. If you will look at the biblical laws you will find that the people were prohibited from using a mixture of linen and wool for robing the dead. Can it be that this restriction was to guard against the prevention of disease germs? Anthrax germs remain alive in a sheep's pelt for *twenty-five* years, though buried under several feet of soil, and sheep feeding in the field after the earth had been disturbed took the disease. Now, if a body had been buried in cloth made from that wool, might not the germs of disease have been preserved just the same? If the body is buried in linen or cotton, perhaps the germs would die out in ten or twelve months. The kind of coffin, method of transportation, etc., should not only be taken into consideration, but the lining of the coffin and the robing of the dead as well.

Dr. Reed—I believe that the rules of the State Board of Health at the present time require, in certain contagious diseases, that the body shall be wrapped in a sheet wrung out of a solution of bi-chloride of mercury, but I don't think the law mentions any thing about additional clothing to be placed on the body.

In regard to the disposal of the body after death, I am a cremationist; until we get something better, I am in favor of cremating all bodies.

Dr. Probst—I want to call your attention to the transportation of bodies where death has resulted from a contagious disease. We have lately had trouble with this matter. A child died here from diphtheria and was sent to Newark for burial, and it was found that the box had not been soldered as required by the board of health. The undertaker here said that he did not consider it necessary to solder it and claimed to be ignorant of that law. The rule is that the body must be inclosed in a hermetically sealed case, and the permit to transport dead bodies requires that the undertaker must make affidavit to the effect that this rule has

been carried out—that the body has been prepared by wrapping it in a sheet as provided, inclosed in a zink-lined box and the same soldered. These rules also require that before the health authorities grant a permit for the transportation of the body of a person that has died of a contagious disease, they must know that it has been prepared in the required manner.

There was another point mentioned in the paper, in regard to the disinfection of rooms; it is stated that the amount of sulphur which should be burned in a room is two pounds for each 1,000 cubic feet of air space. That amount is given by many, but I believe it is now recommended that not less than three pounds should be burned for every 1,000 cubic feet of space; and I think that more safe.

Dr. Collamore—I desire to say a word in regard to the responsibility of health officers in the shipping of bodies. However much he may desire to do his duty, he is very much at the mercy of the physicians where he lives. He must depend upon their diagnosis, and if they say a child died from tonsilitis or croup, he must in nine cases out of ten accept their statement. A year ago, when diphtheria prevailed, two children from the same family died, one, the physician said, from tonsilitis, and the other from croup. The circumstances seemed suspicious and I saw the physician and told him that it was reported to me that these children had died from diphtheria, but he assured me that they had not. The bodies were shipped to Dayton for burial, and were not prepared according to the law governing cases of death from contagious disease, and in Dayton a public funeral was held. Directly after this there was an outbreak of diphtheria in Dayton, apparently originating from this funeral. Now, I took special pains in this case to ascertain whether death resulted from a contagious disease, and it was only upon the assurance of the physician a reputable practitioner, that I allowed the matter to drop. In our city we enforce the law in regard to private funerals of victims of infectious disease, particularly diphtheria, very rigidly, as I think it should be. I have a case in mind where a woman attended a funeral of a diphtheria patient, out of the city. She borrowed a dress and shawl of her neighbors, one on either side of her, and on returning from the funeral took them off and gave them, one to a child on one side and the other to a child on the other side, to carry home. Both of these children took diphtheria and one died. There was a sequence, at any rate, if not a cause and effect. Of course if a body is shipped in a hermetically sealed metal casket, a public funeral in church might be held, probably without harm; but I strongly favor the strict enforcement of the law in regard to private funerals in such cases.

Dr. Probst—May I ask Mr. Hunter a question? Where a physician gives a false certificate, as for instance, certifying that a child has died of tonsilitis when it did, in fact, die of diphtheria, is there any law by which he can be punished?

Mr. Hunter—How did he come to give that certificate?

Dr. Probst—We have a law requiring the physician to give a certificate of the cause of death where a body is to be shipped from one place to another.

Mr. Hunter—He is required to certify to the truth, is he not?

Dr. Collamore—But we might inquire, what is the truth? Points of law are fixed and unchangeable, but in the practice of medicine it is not so. What I might call diphtheria, my brother physician might call tonsilitis, and the question is, what *is* the truth in such a case?

Mr. Hunter—I think the doctor knew better when he certified.

Dr. Collamore—He certified to what he thought was correct.

Mr. Hunter—Now, that is a question of fact.

Dr. Collamore—I wish it were. [Laughter.]

Mr. Hunter—It is a question of fact, and if it turns out that it was done in ignorance, then there is no crime and the man ought to be discharged, but if he did do it intentionally, he ought to be punished, and can be. His saying that he did not know any better will not determine the question; call your experts and let them determine.

Dr. Collamore—It is too late after the death.

Mr. Hunter—If contagion followed the death?

Dr. Collamore—That was the general opinion, that the outbreak originated from the funeral, but it could not be proved.

[Here followed a general discussion as to the duties and authority of health officers, boards of health, etc.]

Mr. Morris—I think the members of the local boards represented here have derived great benefit from this meeting, and it ought to be held annually. Therefore, I move, Mr. President, that the State Board of Health be requested to call a similar meeting annually in Columbus.

[Question put and unanimously prevailed.]

Upon motion, meeting adjourned *sine die.*

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